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THE PHARMACOLOGICAL SHOCK TREATMENT OF SCHIZOPHRENIA.

A Statistical Study of Results in the New York State Hospitals.*

By JNO. R. ROSS, M. D., Wingdale, N. Y.

At the meeting of this organization in Pittsburgh last year, I presented a preliminary report of the results obtained in treating dementia præcox by Sakel's method in the New York State hospitals. At that time the following statement was made: "Does this therapy offer any hope for long-standing cases? Unless this type of patient can be helped, from our standpoint, at least, insulin will have little value, because it is quite evident that we do not receive, nor are we likely to receive, for some time at least, those patients who are in the very early stages of their disease. If a psychosis which has lasted more than six months or a year will not respond to hypoglycemia, little can be hoped for in the state institutions." I believe this can be answered now.

From a recent questionnaire sent to all the superintendents in our department, I obtained their reaction to this treatment and I have attempted to formulate a statement which would be acceptable to the entire group, so that my report is a composite opinion of all the mental hospitals in the State of New York. Some observations made later in the paper will be my personal opinions, where I disagree with parts of the expressed opinions.

Relative to insulin, it is the consensus of opinion that "it has value in acute cases; that the results, where the duration of the disease has lasted more than two years, do not justify the necessary expenditure of time and money." The latter part of this statement is one with which I disagree. This will be discussed at some length later. It was the opinion of three of the institutions that therapeutic talks were essential and of prime importance in the cure.

* Read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, Calif., June 6-10, 1938.

As to the value of metrazol used alone, there was no definite statement, but it was believed that it should be tried for a longer period. It has not yet been used in all the institutions in the state. It was agreed that metrazol has value in selected cases when used to produce the epileptiform seizure (dry shock) during insulin hypoglycemia.

Only a few institutions have tried camphor, and the opinions that have been expressed are definitely against the use of this drug. It is stated that it is not dependable or satisfactory where large numbers must be treated; that it makes patients uncomfortable, occasionally produces marked nausea, vomiting, anorexia, loss of weight and at times collapse. The institutions that have used the camphor treatment have discontinued it because they found it an unsatisfactory therapeutic agent and a difficult one to administer. Moreover, there is nothing specific with which to combat any untoward effects which may occur. This latter statement can also be made concerning metrazol.

Personnel Requirements for Insulin Treatment.

It is the consensus of opinion that in one room one physician can care for 10 patients and if two physicians are assigned to this work, the number should not exceed 20. If larger numbers are to be treated, it is desirable to increase the number of physicians because the work during this treatment is arduous and nerve racking. No physician can or should be expected to do more than carry out the treatment of 10 patients if he is to give them all the care and attention they require. It is even more important not to increase the case load beyond this limit if one wishes to insure the safety of the patients and obtain the best therapeutic results.

In the nursing set-up for 20 patients, there should be one nurse for the utility room; two other nurses or attendants on the ward continuously are sufficient for the first 2-2½ hours of treatment. From that time on, one nurse or attendant is needed for each two patients during the period of coma. In other words, three nurses at the beginning and 10 at the end of treatment.

Statistical Results.

Our report made last year included only 127 cases. Patients had been under treatment for so short a time that nothing definite could be said, but it was believed that the results in these cases warranted further investigation and trial. That report was as of April 24, 1937. This report, which ended April 15, 1938, includes statistics from all the hospitals under the jurisdiction of the New York State Department of Mental Hygiene, including the New York State Psychiatric Institute and Hospital. The number of cases on which this study is based is:

Insulin	1356
Metrazol	523

So that the human equation might be eliminated as far as possible and the results uniform for evaluation, the criteria for recovery, much improved, improved and unimproved were defined as follows: To be classified as "Recovered" the patient must have become entirely symptom-free and must have developed insight regarding his illness. "By "insight" is meant that the patient must fully realize that he had suffered a mental illness and that his symptoms were in fact a part of this illness. He must also be able and willing to speak of his illness in detail and objectively, and with normal affect, and he must be able to adjust well in the community at his pre-psychotic level. The term "Much Improved" means that the patient is entirely symptom-free but that insight as defined above is lacking or incomplete, although he is able to adjust well in the community at or near his pre-psychotic level. The patient is considered "Improved" if his symptoms are incompletely alleviated, but less distressing, so that he is able to make a definitely better adjustment than before treatment. "Unimproved" is applied to those patients who derived no benefit from the treatment.

A total of 1356 patients wtih dementia præcox received insulin treatment. Table 1 shows these patients classified according to duration of illness before treatment and the outcome of treatment. Of this number, 192, or 14.2 per cent, were reported as recovered after such treatment; 280, or 20.6 per cent, were much improved and 357, or 26.3 per cent, showed improvement. A total of 829, or 61.1 per cent, thus showed some degree of improvement. Only

527, or 38.9 per cent, failed to respond to insulin treatment. These statistics may be compared with those for a group of 1039 first admissions with dementia præcox to the Civil State hospitals of New York, none of whom were treated with insulin. Of this control series 36, or 3.5 per cent, were described as recovered; 116, or 11.2 per cent, as much improved and 77, or 7.4 per cent, as improved. The recovery rate of the insulin-treated group exceeded that of the controls by 283 per cent. The rates of much improvement and of improvement were similarly in excess by 84

TABLE 1.

PATIENTS WITH DEMENTIA PRÆCOX RECEIVING INSULIN TREATMENT IN THE NEW YORK CIVIL STATE HOSPITALS, CLASSIFIED ACCORDING TO DURATION OF ILLNESS BEFORE TREATMENT AND OUTCOME OF TREATMENT.

Duration of illness before treatment.	No.					Per cent.				
	Total.	Recovered.	Much improved.	Improved.	Unimproved.	Total.	Recovered.	Much improved.	Improved.	Unimproved.
Less than 6 months.	192	56	58	41	37	100.0	29.2	30.2	21.4	19.3
6 to 12 months.....	195	45	55	40	55	100.0	23.1	28.2	20.5	28.2
1 year	306	45	72	90	99	100.0	14.7	23.5	29.4	32.4
2 years	198	20	36	55	87	100.0	10.1	18.2	27.8	43.9
3 years	114	9	22	33	50	100.0	7.9	19.3	28.9	43.9
4 years	77	4	7	28	38	100.0	5.2	9.1	36.4	49.4
5 years	79	4	8	20	47	100.0	5.1	10.1	25.3	59.5
6 years and over...	195	9	22	50	114	100.0	4.6	11.3	25.6	58.5
Total	1,356	192	280	357	527	100.0	14.2	20.6	26.3	38.9

and 255 per cent respectively. Considering all degrees of improvement as a unit, we find the rate of the insulin-treated group to exceed that of the control group by 173 per cent.

Table 1 shows recoveries and improvements occurring, no matter how long the duration of the illness before treatment. It will be seen that in the group of 195 patients with a duration of six years or more, nine recovered after treatment with insulin and 22 were much improved and 50 were improved. This is important to note since a long existing chronic state of the disease is often held to offer no further hope for successful treatment.

It is evident, however, that the rate of recovery and of improvement depends upon the duration of the illness before treatment. The rates were highest among those who have been ill less than 6 months and gradually decreased as the duration of the illness increased. Contrawise, the percentage showing no improvement increased as the duration of the illness before treatment increased.

PAROLES.

Of the 1356 patients who received insulin therapy, 578, or 42.6 per cent, were on parole. Table 2 shows the number paroled after

TABLE 2.

NUMBER OF PATIENTS WITH DEMENTIA PRÆCOX PAROLED AFTER TREATMENT WITH INSULIN, AND DURATION OF PAROLE.

Duration of illness before treatment.	No. under treatment.	No. paroled. Total	No. paroled. Per cent.	Duration of parole. Under 6 months.	7 months.	8 months.	9 months.	10 months.	11 months.	12 months.	1 year and over.
Less than 6 months....	192	128	66.7	71	19	7	11	10	6	2	2
6 to 12 months.....	195	108	55.4	62	13	10	6	11	3	3	..
1 year	306	155	50.7	80	13	11	9	15	18	5	4
2 years	198	71	35.9	48	6	2	2	9	2	2	..
3 years	114	36	31.6	17	5	2	3	4	3	1	1
4 years	77	25	32.5	16	3	2	2	1	..	..	1
5 years	79	17	21.5	10	..	2	1	..	3	1	..
6 years and over.....	195	38	19.5	24	9	1	..	1	1	2	..
Total	1,356	578	42.6	328	68	37	34	51	36	16	8

treatment and the duration of the parole. Of this total 328 had been on parole for six months or less; 68 had been on parole for seven months; 37 for eight months; 34 for nine months; 51 for 10 months; 36 for 11 months; and 16 for 12 months. Eight had been on parole for over a year. The number paroled varies inversely with the duration of illness before treatment. Of those ill less than 6 months, 66.7 per cent were on parole; those with a duration of 6-12 months had 55.4 per cent on parole; those with a duration of one year had 50.7 per cent on parole. The percentage declined rapidly after the first year and reached a minimum of 19.5 per cent among those who had been ill for six years and

more before the beginning of insulin treatment. The preceding statistics do not include 62 who had been discharged from parole, nor 42 who were awaiting parole. A total of 126 had been returned from parole.

There were 599 patients paroled and 62 were discharged from parole, making a total of 661 patients with dementia præcox who were presumably on parole after treatment with insulin. Of this total 126, or 19.7 per cent, were returned from parole. These may be considered as "failures." The question, therefore, arises as to

TABLE 3.

PATIENTS WITH DEMENTIA PRÆCOX RECEIVING METRAZOL TREATMENT IN THE NEW YORK CIVIL STATE HOSPITALS, CLASSIFIED ACCORDING TO DURATION OF ILLNESS BEFORE TREATMENT AND OUTCOME OF TREATMENT.

	No.					Per cent.				
Duration of illness before treatment.	Total.	Recovered.	Much improved.	Improved.	Unimproved.	Total.	Recovered.	Much improved.	Improved.	Unimproved.
Less than 6 months..	44	5	17	17	5	100.0	11.4	38.6	38.6	11.4
6 to 12 months.....	36	6	5	16	9	100.0	16.7	13.9	44.4	25.0
1 year	104	7	13	36	48	100.0	6.7	12.5	34.6	46.2
2 years	74	1	4	33	36	100.0	1.4	5.4	44.6	48.6
3 years	56	2	4	15	35	100.0	3.6	7.1	26.8	62.5
4 years	37	..	3	16	18	100.0	..	8.1	43.2	48.6
5 years	50	1	2	8	39	100.0	2.0	4.0	16.0	78.0
6 years and over....	122	1	3	27	91	100.0	0.8	2.5	22.1	74.6
Total	523	23	51	168	281	100.0	4.4	9.8	32.1	53.7

how the degree of failure compares with that among all patients paroled from the New York State Civil State hospitals. In a paper by Dr. Horatio M. Pollack, which appeared in the *Psychiatric Quarterly* for April, 1938, it is shown that 9563 patients were placed on parole during 1937 and 3894 were returned from parole during the year. The latter represents 40.7 per cent which is slightly more than twice that found among the groups of insulin-treated patients who were returned from parole.

PATIENTS TREATED WITH METRAZOL ALONE.

A total of 523 patients received treatment with metrazol. Table 3 shows these patients classified according to duration of illness

before treatment and the outcome of treatment. Of this total 23, or 4.4 per cent, recovered after the treatment; 51, or 9.8 per cent, showed much improvement and 168, or 32.1 per cent, were improved. The rates of recovery and much improvement do not differ significantly from those of the control series. It may be noted that the rate of much improvement is even slightly greater in the control group. The improvement rate, however, is more than four times that of the control group. The metrazol results are not so good as those from insulin therapy. Thus the recovery rates in insulin and metrazol groups were 14.2 and 4.4 per cent respectively. The percentages of much improvement were 20.6 and 9.8 per cent for the insulin and metrazol groups respectively. The rate of improvement was slightly higher in the metrazol group, though the difference in percentage is not significant. Combining all degrees of improvement we find that the insulin-treated group showed a rate of 61.1 per cent compared with 46.3 per cent for the metrazol group. As in the case of insulin, the rate of recovery and improvement after treatment with metrazol decreased as the duration of the illness before treatment increased.

Paroles—Metrazol Group.

Seventy-two of the metrazol group were on parole—all of them for six months or less. Eight patients were returned from parole and six discharged. Forty-five were awaiting parole.

Deaths—Insulin Group.

Nineteen deaths were reported from all institutions; a percentage of 1.4 of all cases treated. It was difficult to evaluate these reports as the information was meagre and only two cases came to autopsy. The causes of death reported were two cases of cardiac respiratory collapse; one of cardiac respiratory collapse with pneumonia; three cases from prolonged coma, one of which developed pneumonia; two cases from status epilepticus; five cases from pneumonia, three of which were of the aspiration type, and in one case the cause of death was not given. One other case of death from prolonged coma with status lymphaticus came to autopsy. This showed a persistent thymus, dilated right ventricle and hypertrophied lymphatic system. This patient would not have been

treated if an X-ray of the chest, which should be made in all cases before initiating treatment, had revealed the condition. There is no record that such examination was made. Four other deaths were reported as follows:

1. Pneumonia, 23 days after last treatment—no post mortem.
2. Pneumonia, 11 days after last treatment—no post mortem.
3. Pneumonia, five months after treatment. Post mortem showed a small liver with an area of degeneration about the central veins.
4. Acute dilatation of heart, three months after treatment.

In these four cases, it might be questioned whether insulin was the direct cause of death. It is reported by one institution that electrocardiographic studies showed persistent myocardial changes and a markedly diminished wave amplitude in all leads after completion of insulin treatment. Three deaths ascribed to aspiration pneumonia, bring up the question as to whether these deaths might not have been prevented. Three deaths from aspiration pneumonia in one hospital are too many. A careful investigation of the physical set-up should be made to see that conditions which might be harmful do not exist.

Deaths—Metrazol.

No deaths were reported, but from the hospital where the largest number of cases were treated, it was reported four died from complications during the metrazol treatment. The report follows:

1. After 15 grand mal convulsions, a fracture of the neck of the femur occurred. An open reduction was done. He ran a stormy post operative course and required transfusions. He developed pneumonia and died two weeks after the operation.
2. After four grand mal convulsions, a bilateral lobar pneumonia developed and patient died three weeks after last metrazol treatment.
3. Patient had nine grand mal convulsions and showed improvement; developed a foul odor on the breath, later showed signs in the chest and an abscess of the right lower lobe was found. He died one month after last treatment.
4. Had two grand mal seizures when she complained of a cough, developed lobar pneumonia and died six days after last metrazol treatment.

Discussion.

The opinion expressed by the superintendents that "results in cases of dementia præcox, where the duration of the illness was

over two years, do not justify the time or expense necessary to carry on such treatment," in my judgment will hardly stand in the light of the statistics compiled from the entire state. Their opinion is based on the limited experience of each institution with a small number of such cases. When the figures for all the institutions are combined, the picture is quite different. Three hundred and thirty patients, or 24 per cent of the total number treated with insulin, showed either recovery, much improvement or improvement, where the duration of psychosis was over two years. The actual figures are:

Recovered	46
Much improved	98
Improved	186

It is my belief that these findings made untenable the opinion that cases where the illness has existed over two years do not warrant treatment. Let us consider this from the standpoint of dollars and cents. In the group where the illness had lasted over two years, 187 patients were paroled. For the year ended July, 1936, the average per capita cost per patient for all state hospitals in New York State was $363.89. Assuming these patients would remain on parole only a year, the amount of money saved for the state would be $68,047.43. The total appropriation for all mental institutions in the State of New York for medical and surgical care, supplies and equipment, for the period ended July, 1936, was $175,543. The amount saved by treating and paroling the cases where the illness had lasted over two years would amount to 38 per cent of the total amount of money appropriated for medical supplies in all institutions. I, therefore, believe that until further investigation makes it possible to definitely say that certain types of cases will or will not respond to treatment, all cases should be treated regardless of the duration of the illness.

Table 1 bears out this contention. While the number that responds grows definitely less with the duration of the disease, nevertheless, cases in which the illness had lasted over six years show—nine recovered, 22 much improved and 50 improved—81 cases in all affected in this group alone.

These statistics suggest certain lines of investigation. Why is it that in the group that offers the greatest hope for improvement;

namely, where the duration has been less than one year, are there so many patients that do not show any improvement? In the group of less than six months' duration, there are 37 and in the 6-12 months group, there are 55—a total of 92 that are unimproved, while on the other hand in the group of more than six years' duration, there are nine recovered. It would appear that there are cases that will recover with treatment, no matter how long the duration of the disease, while there are others that will not respond under any condition. Are these psychoses the same, and if not what is the difference? It opens interesting lines of investigation. The report from one hospital, that after treatment with insulin, the electrocardiogram shows definite damage to the heart should be investigated. Why so many that have died developed pneumonia needs investigation. Is this caused by faulty technique or is the resistance so lowered that the individual is more susceptible to an intercurrent disease?

We believe that this treatment has passed its trial period and that it should be used in all hospitals for mental disease. We believe that the best results will only be obtained where Sakel's treatment is followed without deviation, and that before attempting to treat, a physician should have, as a minimum, six weeks of intensive instruction. There is no question that the greater the experience of the physician, the better the results will be. There are hospitals in various parts of the country competent to give instruction and it is hoped that they will be made available to anyone who wishes to have it free of charge. For those who cannot obtain it anywhere else, the Harlem Valley State Hospital offers its facilities as we have done in the past. With bedside instruction available in this technique, there is no justification to subject patients to the dangers of inexperienced and unskilled physicians. Some difference in results will undoubtedly occur and these, in my opinion, are to be expected. One should not look for the same degree of skill in all physicians employing this treatment, any more than in any other procedure requiring experience and special aptitude or ability. Better and more uniform results will be a natural consequence of longer experience and greater familiarity with Sakel's technique. A complete record with a close follow-up of all cases paroled or discharged should be kept for at least two years.

Conclusions.

1. Beneficial results from treatment of all cases of dementia præcox with insulin of no matter what duration are much greater than the results in the untreated group.

2. The results of treatment with insulin are much better than results obtained from metrazol alone.

3. Combination of metrazol with insulin apparently assists the action of insulin in selected cases.

4. Treatment with camphor is not recommended by those who have used it in the New York State hospitals.

5. The results obtained in cases where the duration is over two years not only justified the expense and time but shows it would be an error to neglect such cases.

6. The recovery and improvement rates are progressively less according to the duration of the illness.

7. The dangers of insulin therapy in the hands of experienced and trained physicians is almost negligible.

8. An active educational campaign should be carried on, so that an early diagnosis of dementia præcox can be made and treatment instituted at the earliest possible date.

In conclusion, I wish to express my appreciation to all the superintendents in the New York State Department of Mental Hygiene who have so willingly supplied me with the material necessary for compiling statistics and also for their expression of opinions on the Pharmacological Shock Treatment.

To Drs. LaBurt, Rossman and Cline, of my staff, I am indebted for aid in the preparation of this study.

I am under deep obligation to Dr. Benjamin Malzberg of the Statistical Bureau of the Department of Mental Hygiene, for assistance in compiling statistical material.

To the Commissioner, Dr. Tiffany, I wish to express my gratitude for permitting Dr. Malzberg to spend some time at the Harlem Valley State Hospital while this paper was in preparation.

To my secretary, Miss Margaret Mullen, who had no avenue of escape from listening to the reading and re-reading of this paper and who typed, checked and rechecked the figures, I am very grateful.

USE OF METRAZOL IN THE FUNCTIONAL PSYCHOSES.*

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In a previous communication [1] we discussed our observations with metrazol on 66 schizophrenic patients. Our series (of schizophrenic patients) now consists of 300 cases, and in addition we have studied the results of this form of therapy in 49 patients suffering from manic-depressive psychosis, and in 21 with various other forms of functional disorders. Among the latter group, involutional melancholia, psychoneurosis, and paranoid state are represented.

SCHIZOPHRENIA.

It has been shown in previous reports that the results of the treatment correlate closely with the duration of the psychosis; therefore we have classified our results accordingly. Among the 300 dementia præcox patients treated there were 19 who had been ill for six months or less; 46 who had been ill from 7-18 months; 146 who had been ill from 19 months to five years, and 86 patients ill from 5-21 years.

The criteria for remissions and the various grades of improvement have remained the same as in our previous report,[1] and correspond closely to the standards set up by other authors.

Of the first group of 19 patients (six months' duration) eight (42 per cent) made a complete remission; six (31 per cent) made a social remission. This gives a total remission rate of 73 per cent.

* Read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, Calif., June 6-10, 1938.

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The remaining number of patients showed either a slight improvement, or, at least, a better institutional adjustment. No patient in this group failed to show some favorable response.

In the second group of 46 patients (7-18 months) 10 (22 per cent) made a complete remission; seven (15 per cent) made a social remission, giving a total remission rate of 37 per cent. Thirty-two per cent showed a slight improvement only, and 31 per cent failed to show any response whatsoever.

In the third group of 146 patients (19 months to five years) 11 (7.6 per cent) made a complete remission; six (4.1 per cent) made a social remission, making a total remission rate of 11.7 per cent. Sixty-five patients showed slight improvement only, and the remaining 64 failed to evidence any response to treatment.

In the fourth group (ill over five years) no complete or social remissions were obtained. Twelve per cent showed a slight improvement, but the remainder did not show any change in their symptoms.

Although slightly better results were observed in the catatonic type of dementia præcox than in the other types, the improvement rate being 13 per cent higher than in the paranoid group, the difference does not seem to be sufficient to warrant a definite conclusion as to a more favorable response of one sub-group as compared with others.

In 35 cases in which metrazol, alone, failed to produce any improvement, a combination of metrazol and hyperpyrexia was tried, but no beneficial results were obtained with such a combination. Metrazol was also combined with benzedrine, sodium alurate, and sulphur-in-oil,* without producing any definite change in the psychotic symptoms.

The relapses in the schizophrenic group were few; only one patient failed to maintain his remission level, and after receiving 10 more treatments, he attained a complete and lasting remission.

Manic-Depressive Psychosis.

Twenty-seven patients suffering from manic-depressive psychosis, manic type, were treated; seven of these recovered. The average duration of the attack in these patients was 10.5 months.

* Fever therapy; see this Journal for Aug., 1937.

In the group which did not show a complete response to treatment, the average duration of the manic attack was 21.5 months. Thirteen patients in the depressed phase were treated; five recovered, the duration of the attack being from 2-24 months. Of nine patients of the mixed type, only two recovered.

Many manic-depressive patients respond to metrazol therapy, showing a complete remission after a few injections, but soon relapse and in most cases fail to respond to further treatment with metrazol. Convulsive treatment with metrazol injections seems to be of some benefit in the treatment of this type of functional psychosis, but cannot be considered to be of specific therapeutic value.

This form of therapy should be used in patients in the depressed phase, in whom the psychosis has extended over a considerable period of time, when all other forms of therapy have proved to be of no avail.

Involutional Psychoses.

Of the group of involutional patients treated, two had complete remissions, and the remainder showed varying degrees of improvement. Because of the disappointing response of this form of psychosis to other methods of therapy, we recommend metrazol treatment, in spite of the low recovery rate.

In the group of other functional reaction types (13 patients) only one patient, diagnosed severe psychoneurosis, recovered, while the remainder did not show any response whatsoever to the therapy.

Physiological Action.

The physiological action of metrazol on the central nervous system is unknown in so far as the amelioration of the mental symptoms in functional psychoses is concerned. The examination of the blood serum for its constituents during the various stages of the convulsion gives many diverse results.

The sugar level of the blood begins to change in the short interval immediately following the injection and just before the beginning of the convulsion, showing an average drop of about 10 mgs. per cent, and occasionally as high as 18 mgs. per cent. With the

occurrence of the convulsion, the blood sugar level rises very sharply, reaching a point far above the original level within one-half hour after the convulsion, returning to normal in about 2½ hours after the injection.[2] We are inclined to believe that the increase of blood sugar is due to an increased output of adrenalin during the convulsion, with secondary liberation of glycogen from the tissues.

We studied this release of vasomotor substances by the Trendelenburg method and demonstrated that these substances increase in the blood serum during and for about one-half hour after the convulsion. The extreme muscular activity during the convulsion prohibits a critical conclusion as to the chemical constituents of the blood. During the short pre-convulsive period the phosphorus content shows a tendency to drop, while the corresponding calcium level rises. The cholesterol level in this phase drops very sharply, rising again during and after the convulsion. Most of these substances have returned to their normal level within 2½ hours after injection.

The hydrogen ion concentration[3] also shows various values during the different stages of the treatment. Due to the higher ventilation before the convulsion, there is marked alkalosis, while after the convulsion due to the liberation of a large amount of lactic acid, the pH value may drop to 7.13 or less. (As low as 6.82 has been recorded.)

There is a marked rise in the oxygen consumption rate—usually about 40 per cent—lasting for several hours after the convulsion. A marked anoxemia occurs in the entire organism. Various authors[4] have reported studies on the decreased utilization of oxygen during the convulsion, with a marked anoxemia occurring in the tissues. Direct inspection of the blood vessels of the brains of rats during metrazol convulsion, shows a contraction of the blood vessels at the time of the convulsion, giving rise to a marked pallor and an enormous swelling of the brain, which prolapses through the trephined opening. We made similar observations in which we visualized by serial X-ray exposure and injection of thorotrast the arteries of the brain within the intact rabbit skull. These observations did not differ from those seen in the rats. Such a severe interruption of the blood supply, with a marked anoxemia, will find its expression in pathological changes such as have been

demonstrated in rabbits which had been treated over a long period of time and were greatly over-dosed.[5]

Another very interesting change in the blood serum was noted. Specific substances which inhibit hemolysis in a hemolytic system (white matter of the brain being used as antigen) increase in amount with prolongation of treatment. We are inclined to believe that these substances are related to changes occurring in the tissue of the brain.

The effect of the metrazol convulsion on the autonomic nervous system was also studied by various methods. At the end of the tonic and at the beginning of the second clonic phase a marked rise of bladder tonus occurs, leading to a marked increase in bladder tension.[6] In rabbits the stomach does not show any contraction,[6] either upon direct inspection or when studied with aid of fluoroscope, while the small intestines show marked peristalsis shortly after injection. The spinal fluid pressure rises very markedly, starting in the first clonic phase and reaching its highest point with the end of the tonic phase, returning to normal at the conclusion of the convulsion.

Conclusions.

All these observations point towards a profound alteration of the metabolic process of the organism as an effect of metrazol, which is of much longer duration—usually 2½ hours—than one would generally assume. While the unconscious state lasts not more than a few minutes, a careful study of the extent and duration of the mental confusion following the metrazol convulsion, by means of psychometric tests, shows a decided drop in almost all cases one-half hour after treatment. The patients' efficiency on the tests (attention, immediate reproduction, retention, and association) was usually at zero level at this time. Two and one-half hours after the injection, when the blood constituents had already returned to normal, the psychometric tests were still low. At this time the patients' efficiency had returned to 70 per cent of their preconvulsive level. The before-treatment efficiency was equalled or surpassed between four and eight hours after the injection. The increased efficiency in some of the patients seemed to be based principally on a change of attitude. These patients showed

a greater interest and better attention and rapport with the examiner. It has been said that the marked anoxemia [7] which occurs, giving rise to a stimulation of the sympathetic nervous system, is the therapeutic factor of metrazol therapy in dementia præcox. There is no doubt that such a stimulation occurs as we have shown by the liberation of a large amount of adrenalin, similar to the effect of insulin-shock therapy, but we are inclined to believe that other factors are responsible for the amelioration of symptoms in functional psychoses, since the stimulation of the sympathetic nervous system with thyroxin [8] and other sympathetic-cotonic drugs does not produce any beneficial effect upon the patient's mental condition.

In spite of the fact that the specific effect of metrazol on the central nervous system is unknown, we think that this agent is a valuable aid in the treatment of some of the functional psychoses.

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RESULTS TO DATE WITH THE PHARMACOLOGICAL SHOCK TREATMENT OF SCHIZOPHRENIA.

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In our report to this body a year ago,[1] we were mainly concerned with establishing the value of a new treatment of psychoses. Today we should like at first to reaffirm the conclusions reached at that time. Without undertaking a detailed analysis of our statistics, we can report that in cases of less than six months' duration our results have been particularly striking. In this group 22 out of 28 cases, or about 78 per cent, have responded with full recovery or recovery with only slight defect, and the large majority of more chronic cases have benefited in varying degrees from treatment.

If we disregard the immediate effect of treatment and tabulate our cases merely on the basis of their present condition, as determined by recent re-examination, it can be said that the results of treatment have on the whole been well sustained so far. It was, however, necessary to reclassify a large proportion of our cases in the course of the past two years since treatment was begun, some upward and some down. A number of the cases that were conservatively classified at the time of discharge as negative or merely improved, made good progress outside the hospital and were accordingly reclassified. Four cases that had been discharged as fully recovered relapsed and returned to the hospital.

It is noteworthy that all four of these cases had unusually short courses of treatment (20, 32, 17 and 21 days respectively) with very few shock reactions (8, 18, 13 and 5). Only a single case in this group could be given a second course of treatment, and he responded favorably to it.

Five incompletely recovered cases also relapsed after periods ranging from one to nine months, but all of them responded to a second (and more thorough) course of treatment, and were again discharged.

* Read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, Calif., June 6-10, 1938.

With regard to the question of relapses, we conclude that relapses do occur after successful insulin treatment, but that they frequently are related to shortcomings in technique, and are fortunately usually amenable to a second course of treatment. The

RESULTS AFTER INSULIN TREATMENT WHICH BEGAN SEPTEMBER, 1936.

	Less than 6 mos.	6–18 mos.	Total.	Over 18 mos.	Total.
Remission..	14	1	15	....	15
Improved with slight defect.....	8	4	12	7	19
Improved...	....	2	2	4	6
Unimproved	6	4	10	11	21

FOLLOW-UP OF INSULIN CASES.

	Less than 6 mos.	6–18 mos.	Total.	Over 18 mos.	Total.
	14	2	16	....	16
	4	2	6	5	11
	1	2	3	5	8
	8	5	13	11	24
Dead	1	....	1	1	2

61 CASES TREATED.

RESULTS AFTER METRAZOL TREATMENT WHICH BEGAN AUGUST, 1937.

	Less than 6 mos.	6–18 mos.	Total.	Over 18 mos.	Total.
Remission..	5	....	5	....	5
Improved with slight defect.....	3	2	5	2	7
Improved...	3	2	5	3	8
Unimproved	2	2	4	6	10

FOLLOW-UP OF METRAZOL CASES.

	Less than 6 mos.	6–18 mos.	Total.	Over 18 mos.	Total.
	5	....	5	1	6
	2	1	3	2	5
	3	1	4	1	5
	3	4	7	7	14

30 CASES TREATED.

lesson we have learned from a review of our relapsed cases is that, though both over-treatment and under-treatment are harmful, beginners—such as we were—are more likely to err on the side of under-treatment, and are liable to discharge their patients too soon after the psychotic symptoms disappear.

The Convulsive Reaction.

Several of our cases that showed relatively little response to insulin treatment made some further progress after a series of seizures were induced with intravenous metrazol according to Meduna's method. Moreover, two of our relapsed cases responded successfully to a second course of exclusively convulsant shock treatment with metrazol. On the other hand, two cases that had undergone unsuccessful courses of metrazol treatment were treated with insulin and both of these cases recovered. All this raises some interesting and important questions on the significance of the epileptic seizure in the pharmacological shock treatment.

Insulin, it should be remembered, is a convulsant drug and years ago attempts were even made to standardize the unit of insulin by its convulsant properties. Before the advent of the use of intravenous metrazol, we found that about one-third of our cases had convulsions during the course of insulin treatment. Mild epileptoid manifestations are even more common, and it is almost typical to see evidences of increased irritability of the central nervous system during hypoglycemia, especially just before the onset of coma. If a patient is examined at this time, it will often be found that a tap of the hammer at almost any point of the body will induce a mass reflex response of almost the entire somatic musculature, and if this irritating stimulus is made strong enough, or if a tube feeding is undertaken at this point, an actual seizure may be induced. If, moreover, a relatively small amount of an irritant drug such as 2 or 3 c.c. of 10 per cent metrazol is introduced intravenously at this point, the threshold of irritability may be so far reduced that a convulsion will ensue. It has been demonstrated by Georgi and Strauss [2] and Wechsler [3] abroad that much less metrazol is needed to produce convulsions during hypoglycemia than otherwise, especially if the right moment is chosen for the injection. If, for example, you inject 3 c.c. of metrazol early in hypoglycemia while the patient is somnolent, you may produce little or no response. But if the same amount is injected an hour or two later when hypoglycemic epileptoid twitchings have supervened, a severe seizure can be easily induced.

It is now being generally recognized that cases that do not respond to insulin coma may respond to the induced seizure, and

vice versa. At the Bern Congress in Switzerland last year, Meduna [4] reported 10 cases that failed to respond to insulin but responded to metrazol. "But," he added, "I have also seen cases that did not improve with metrazol, but finally responded to insulin treatment with remission." Sakel [5] has also made it clear that he feels metrazol should be used in certain types of resistant cases, and very properly insists that the therapeutic value of epileptic seizures in certain cases was recognized from the beginning of the insulin shock treatment. Under the circumstances, what ought to be the procedure in psychiatric hospitals? It might seem at first that the question could be solved simply by treating two separate series of cases, one with induced seizures and one with insulin coma, comparing results, and then giving preference to the better treatment. But since insulin is also a convulsant drug, and since a considerable number of cases do experience epileptic seizures in the course of insulin treatment, the lines cannot be sharply drawn. For if a spontaneous epileptic seizure occurs in the course of insulin treatment, and a subsequent improvement in the patient's condition is noted, the physician will naturally want to increase the frequency of seizures in that case by using metrazol. The epileptic seizure cannot be taken out of the scope of insulin shock treatment because it has been there from the beginning. So far as the insulin shock treatment is concerned our task is mainly to find out more precisely when the seizures help and when they do not, and diminish their frequency (by using barbiturates) or increase their frequency (with metrazol) accordingly.

The proper formulation of the question is: Can the comparatively simple and inexpensive metrazol convulsant treatment give results sufficiently good to justify its prior and exclusive use in preference to insulin, when a psychotic patient is brought to the hospital for treatment? To answer this question a series of cases at Bellevue were given a course of exclusively convulsant metrazol treatments, and the results tabulated in the same way as our insulin cases. Though this series is still comparatively small, our data indicate that metrazol produces remarkable results. But the difference in results with metrazol alone and with the individualized shock treatment, especially in cases of more recent onset, is marked. To mention one typical group: with patient ill up to a year and a

half before treatment was begun, we achieved a recovery rate of 52 per cent with the exclusively convulsant treatment as against a 69 per cent recovery rate with the individualized shock treatment. It is also our impression that the metrazol remissions were relatively slightly less well sustained, and one of our cases has already had three courses of metrazol treatment. This difference would be even greater if the occasional use of metrazol within the scope of insulin treatment had been practiced in our first cases. Since the element of time is so important, we feel it is wrong to introduce a treatment with a procedure which offers the patient anything less than the best possible chance of recovery. The variations in type of shock reaction which we can now deliberately use, give the individualized treatment great advantages over the simpler and less complicated convulsive treatment. We conclude, therefore, that in hospitals equipped and ready to give systematic pharmacological shock treatment, the use of insulin, together with the use of metrazol under special indications, remains the treatment of choice.

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THE INSULIN TREATMENT IN SCHIZOPHRENIC PATIENTS.*

Clinical and Biochemical Studies.

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Our previous studies on the insulin treatment [1, 2] make it unnecessary to describe our observations on its course in individual cases, or to present a synthetic study of the various aspects of the treatment, *i. e.*, dosage, tolerance, physiological and personality reactions, and difficulties inherent in the treatment.

This report will, therefore, briefly outline our experience in 60 cases under three items:

I. Unusual reactions during and following termination of individual treatments.

II. Therapeutic results.

III. Biochemical studies.

I. Unusual Reactions During and Following Termination of Individual Treatments.

Reactions deserving particular mention were observed in five out of our 60 patients treated:

1. A female schizophrenic patient, 38 years old, remained in the hospital for six years before the beginning of the treatment. On August 3, 1937, she

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We are indebted to the Supreme Council, 33° Scottish Rite Masons of the Northern Jurisdiction, U. S. A., for the financial help granted for our research work in schizophrenia.

[1] Experience with the hypoglycemic treatment of schizophrenia. Am. J. Psychiat., 94: 135, 1937.

[2] Insulin shock treatment of schizophrenic patients. Arch. Neur. Psych., 39: 1, 1938.

received 110 units of insulin and was left in coma for one hour. She awoke as usual after the administration of glucose by tube. Soon after lunch, she had a generalized convulsion and a cardiovascular collapse which rapidly yielded to adrenalin and i. v. glucose. It should be noted that before glucose and adrenalin were given the blood sugar was 122 mgm. per cent. Within the next four hours, the patient had 11 convulsions at about 20-minute intervals. She received sodium luminal i. v. (7½ gr.) and saline hypodermoclysis. The last convulsion at 5 p. m. was followed by deep sleep. The patient awoke only the next morning and showed a remarkable improvement in behavior.

2. The second case with unusual reactions is that of a female schizophrenic, 34 years old, whose illness was of one year duration. On November 9, 1937, the patient awoke as usual after she received glucose by tube. Fifteen minutes later her pulse became very weak but it rapidly improved after the administration of adrenalin. Yet, the patient fell into coma from which she emerged only the next morning at 9 a. m. Within the first six hours of coma, the pulse was of good quality, but rapid, from 120 to 140, the temperature reached 103.2°, the blood sugar was 33, 47 and 53 mgm. per cent, in spite of glucose administrations by tube and vein. It is interesting to note that a spinal puncture done about five hours after the onset of coma had a calming effect on the patient's restlessness and that the spinal fluid sugar was 143 mgm. per cent. The patient's reaction to the treatments is also worth noting. When out of coma she usually asked how many times she would have to die. She said that she was happy because she was again alive. This patient, like the previous one, remarkably improved after this prolonged coma.

3. The third case is a female schizophrenic, ill for six years. She usually remained in coma for 1 to 1½ hours. Only after one treatment she remained in a semi-comatose state for over eight hours; her blood sugar was 13 mgm. per cent. The uncalled for prolonged coma had no therapeutic effect.

4, 5. In two male schizophrenics coma was also prolonged, respectively eight and ten hours; there was no noticeable therapeutic effect.

While convulsions are no longer regarded as unusual or undesirable reactions, it is interesting to note that out of our 60 patients treated, 17 had convulsions during one or more individual treatments. In certain cases sodium luminal was used and proved to be beneficial in decreasing the frequency of convulsions, in reducing convulsions to rather mild muscular twitchings and in accelerating the beginning of coma.

II. Therapeutic Results.

In this short communication only one aspect of the illness, namely, its duration, is considered in the grouping of the therapeutic results. *Remission* implies complete freedom from psy-

chotic symptoms and satisfactory adjustment outside of the hospital. *Improvement* is applied to marked favorable change in the patient's behavior, allowing him, under favorable circumstances, to adjust socially, even outside of the hospital. The results are summarized in Table 1.

TABLE 1.

THERAPEUTIC RESULTS OBTAINED WITH INSULIN TREATMENT IN 60 SCHIZOPHRENIC PATIENTS.

Duration of illness.	Cases no.	Remission.	Improvement.	No change.
2 to 6 months	16	11 * (one for 6 weeks) (one for 1 mo.)	2	3
6 to 12 months	11	4 (one for 3 mos.)	1	6
12 to 18 months	3	1	..	2
2 to 3 years	7	3	1	3
3 to 6 years	17	2	..	15
9 to 19 years	6	..	1	5
Total	60	21 (35%)	5 (8.3%)	34 (56.7%)

* In one case the remission occurred one month after treatment was discontinued.

III. BIOCHEMICAL STUDIES.

The results of these studies are presented in two tables and two charts, the latter giving the results obtained in 12 patients. Each

TABLE 2.

BLOOD CONSTITUENTS STUDIED IN INSULIN THERAPY.

1 Total protein	12 Sodium	24 Hemoglobin
2 Albumin	* 13 Potassium	25 RBC count
3 Globulin	14 Calcium	26 Vol. pkd. RBC
	15 Magnesium	27 Mean corp. vol.
4 Non-protein nitrogen	* 16 Serum solids	* 28 WBC count
* 5 Urea nitrogen	* 17 Phosphorus (inorg.)	* 29 Differential count
6 Uric acid	18 Chlorides	30 Sedimentation test
7 Creatinine	19 CO_2 comb. power	* 31 Viscosity
8 Total creatinine	20 CO_2 content	32 Clotting time
* 9 Amino acid nitrogen	* 21 Lactic acid	
* 10 Sugar		
* 11 Fermentable sugar	22 Cholesterol	
	23 Vitamin C (ascorbic acid)	

* Constituents which showed changes during the insulin coma.

CHART I

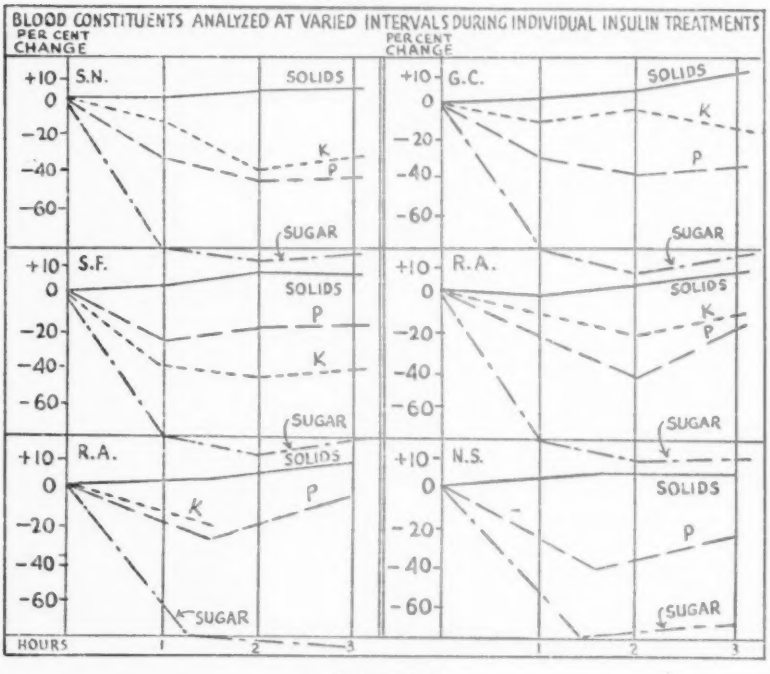

CHART I-A

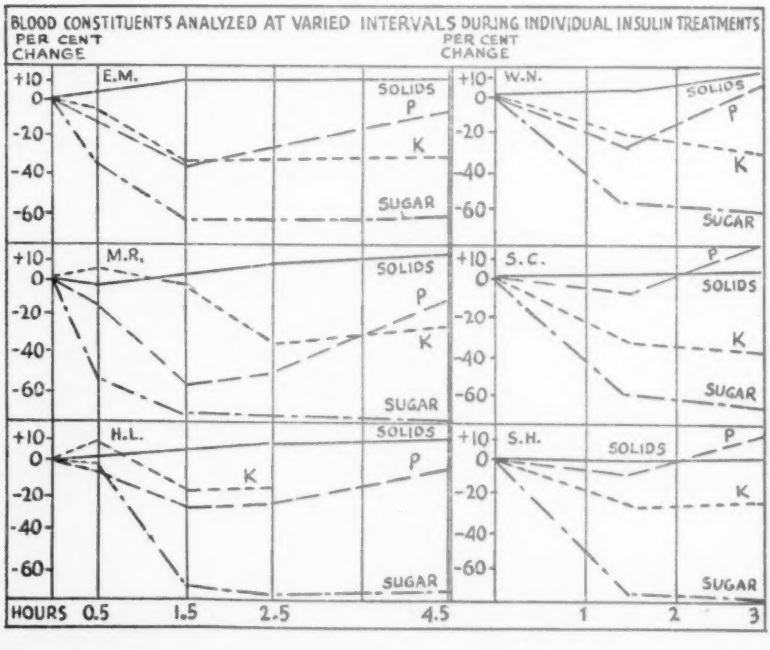

chart contains the results of the analyses of the same constituents in six patients. The reading of the tables and charts would make

TABLE 3.

BLOOD CONSTITUENTS WHICH SHOWED CHANGES DURING THE INSULIN COMA.

			Decrease.				Increase.		
Fermentable	Cases no.	Tests no.	Over 25%.	10% to 25%.	0% to 10%.	0% to 10%.	10% to 25%.		Over 25%.
sugar	5	5	5(78 to 94%)	..	..		..	..	
Phosphorus (inorg.)	30	37	12(25 to 45%)	11	9		1	4	
Potassium	26	27	5(25 to 45%)	13	8		1	..	
Amino acid nitrogen	10	11	.....	7	1		2	1	
Urea nitrogen ...	9	9	.....	5	4				
Viscosity	11	11	.....	..	3		2	6	
Serum solids ...	10	12	.....	..	..		7	5	
Lactic acid	8	12	1(35%)	..	..		2	1	8(25 to 239%)
WBC count	13	14	.....	..	..		..	..	14(50 to 368%)
Segmented neutro.	13	14	.....	..	..		3	3	8(25 to 77%)
Lymphocytes	13	14	12(25 to 83%)	2	..		..	..	

superfluous the description of the data thus presented. The discussions and an attempt to evaluate these data is deferred for another occasion.

INSULIN-HYPOGLYCEMIA TREATMENT OF SCHIZOPHRENIA.*

Results and Follow-up Studies of 106 Cases.

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The purpose of the present paper is an attempt to evaluate the merits of this new form of therapy on the basis of follow-up studies of 106 cases treated at the Galveston State Psychopathic Hospital. No attempt will be made to describe the administration of insulin nor to review the literature.

The best statistical evaluation of the data would be to compare the results of insulin treatment with untreated control cases of equal number, representing similar clinical conditions. These requirements are difficult to fulfill adequately at present. We have, therefore, chosen to study the post-hospital course of the insulin-treated cases and evaluate the merits of insulin by comparing the immediate results in the cases treated with their subsequent course.

In any tabulation of results, it is important to know if all cases were treated routinely or whether a selection of cases was made.

During the period from March, 1936, to January 1, 1938, 151 cases of schizophrenia were admitted of whom 106 were treated. Forty-five cases were not treated because we were forced to limit the number of simultaneously treated cases. Twenty-one of these untreated cases were of less than 18 months' duration. Among these were cases in which our impression was—as has been corroborated by the subsequent course—that improvement would occur under psychotherapy and routine care. The selection of chronic cases was for the most part purely accidental, depending on available accommodations. Eleven of the chronic cases had had previous attacks from which they recuperated.

* Abstract of paper read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, Calif., June 6-10, 1938.

From the Galveston State Psychopathic Hospital (L. R. Brown, M. D., Supt.).

From all of this it will be seen that our selection of cases was not favorable to our statistics in recent cases but was somewhat favorable in chronic cases.

We divided the immediate and follow-up results of our material in four groups according to the generally accepted line of classification. We regarded a case a complete remission (CR) if the patient exhibited: (1) Disappearance of the psychotic symptoms, (2) adequate emotional response, (3) insight, (4) ability to return to former work. We regarded a case as a social remission (SR) if any one of the above mentioned four criteria was missing. We classified a case a partial remission (PR) or improved if certain symptoms disappeared and the patient was able to get along outside of a hospital. We applied the criteria mentioned above with a certain strictness believing that it is more important in the evaluation of a new method to be rather critical than too optimistic and be disappointed later.

Since all cases included in this series completed the treatment before January 1, 1938, every case has been followed for more than three months. We have obtained follow-up information on 96 of the 106 cases treated. Three cases died during the treatment and in seven cases we failed to obtain a follow-up report.

The series of 106 cases includes 47 (44.33 per cent) male and 59 (55.66 per cent) female patients. Thirty-one of the 106 cases, or 29.34 per cent, had a duration of less than six months. Thirty-five (33.01 per cent) cases had a duration of between 6 to 18 months, out of which 17 were of 6 to 12 months' and 18 cases of 12 to 18 months' duration. Forty cases (37.73 per cent) had a duration of more than 18 months. For the sake of convenience we shall refer to the first group (less than six months' duration) as recent cases, to those between 6 and 18 months' duration as subacute and to those with a duration of more than 18 months as chronic cases.

We administered altogether 4664 treatments, thus giving an average of 44 insulin treatments per patient.* The administration of the treatment conformed to the method of Sakel. The polarization-phase, however, was not used routinely.

* The insulin used was most generously supplied by E. R. Squibb & Sons, N. Y.

TABLE 1.

IMMEDIATE RESULTS ACCORDING TO DURATION.

Duration of illness.						Duration of attack.					
In months.	No. of cases.	Good remiss. (Cr+Sr).	Pr.	Total No. of		In months.	No. of cases.	Good remiss. (Cr+Sr).	Pr.	Total No. of	
				Benef. cases.	Unbenef. cases.					Benef. cases.	Unbenef. cases.
−6	31	17 (54.83%)	7 (22.58%)	24 (77.41%)	7 (22.58%)	−6	47	24 (51.06%)	12 (25.53%)	36 (76.59%)	10 (21.27%)
6−18	35	9 (25.71%)	10 (28.47%)	19 (54.28%)	15 (42.86%)						
18+	40	8 (20%)	12 (30%)	20 (50%)	18 (45%)	6+	59	10 (16.96%)	17 (28.81%)	27 (45.77%)	30 (50.85%)
Total	106	34 (32.07%)	29 (27.37%)	63 (59.44%)	40* (37.73%)	Total	106	34 (32.07%)	29 (27.37%)	63 (59.44%)	40* (37.73%)

*Three other cases died during treatment.

TABLE 2.

RESULTS IN 96 FOLLOW-UP CASES ACCORDING TO DURATION OF ILLNESS.

Duration of illness in months.	No. of cases.	Condition on discharge.				Condition at present.			
		Good remiss. (Cr+Sr).	Pr.	Total No. of		Good remiss. (Cr+Sr).	Pr.	Total No. of	
				Benef. cases.	Unbenef. cases.			Benef. cases.	Unbenef. cases.
−6	29	16 (55.17%)	7 (24.14%)	23 (79.31%)	6 (20.69%)	13 (44.83%)	5 (17.24%)	18 (62.07%)	11 (37.93%)
6 − 18	32	9 (28.12%)	9 (28.13%)	18 (56.25%)	14 (43.75%)	10 (31.25%)	2 (5.25%)	12 (37.5%)	20 (62.5%)
18+	35	8 (22.85%)	10 (28.57%)	18 (51.42%)	17 (48.58%)	10 (28.57%)	8 (22.85%)	18 (51.42%)	17 (48.58%)
Total..	96	33 (34.37%)	26 (27.08%)	59 (61.45%)	37 (38.55%)	33 (34.37%)	15 (15.63%)	48 (50%)	48 (50%)

TABLE 3.

RESULTS IN 96 FOLLOW-UP CASES ACCORDING TO TYPE OF CASES.

Type of illness	No. of cases.	Condition on discharge.				Condition at present.			
		Good remiss. (Cr+Sr).	Pr.	Total No. of		Good remiss. (Cr+Sr).	Pr.	Total No. of	
				Benef. cases.	Unbenef. cases.			Benef. cases.	Unbenef. cases.
Par.....	39	14 (35.89%)	13 (33.34%)	27 (69.23%)	12 (30.77%)	16 (41.02%)	8 (20.52%)	24 (61.54%)	15 (38.46%)
Heb.....	29	3 (10.34%)	10 (34.49%)	13 (44.83%)	16 (55.27%)	3 (10.34%)	4 (13.79%)	7 (24.13%)	22 (75.87%)
Cat.....	19	11 (57.89%)	3 (15.79%)	14 (73.68%)	5 (26.32%)	10 (52.63%)	1 (4.95%)	11 (57.58%)	8 (42.42%)
Simp.....	2	.....	.....	.....	2	.....	2	2	.....
Undiff....	7	5 (71.43%)	.....	5 (71.43%)	2 (28.57%)	4 (57.14%)	.....	4 (57.14%)	3 (42.86%)
Total..	96	33 (34.37%)	26 (27.08%)	59 (61.45%)	37 (38.55%)	33 (34.37%)	15 (15.63%)	48 (50%)	48 (50%)

TABLE 4.

Post-Hospital Course According to Condition on Discharge.

Condition	No. of cases.	Time of follow-up in months.												At present.				
		3 — 6.				6 — 12.				12 —				Total results.				Condition of cases.
		Sta.	Imp.	Wor.	Rel.	Sta.	Imp.	Wor.	Rel.	Sta.	Imp.	Wor.	Rel.	Sta.	Imp.	Wor.	Rel.	
Compl. rem...	16	2	...	...	1	6	...	1	1	3	...	2	...	11	...	3	2	14
		Total No.: 3				Total No.: 8				Total No.: 5								
Soc. Rem..	17	3	...	...	4	4	1	...	3	2	...	...	...	9	1	...	7	19
		Total No.: 7				Total No.: 8				Total No.: 2								
Part. Rem..	26	5	2	...	6	2	5	...	3	1	2	...	...	8	9*	...	9	15
		Total No.: 13				Total No.: 10				Total No.: 3								
Unimp..	37	12	1	...	...	15	5	...	...	3	1	...	...	30	7	...	...	48
		Total No.: 13				Total No.: 20				Total No.: 4								
Total	96	36				46				14				58	17	3	18	96

*Two cases Cr, seven cases Sr.

TABLE 5.

CASES WITH PREVIOUS ATTACK

Level of improvement without insulin.		Result of insulin in treatment.				
Condition.	No. of cases.	Cr.	Sr.	Pr.	Unimp.	Died.
Complete remission...	6	3	2	....	1	....
Social remission...	4	....	2	1	1	....
Partial remission...	6	....	....	4	1	1
Total....	16	3	4	5	3	1

TABLE 6.

COMPARISON OF 106 INSULIN-TREATED CASES WITH 45 SELECTED UNTREATED CASES.

Duration of illness in months.	Insulin group.			Non-insulin group.		
	No. of cases.	Benefited.	Unbenefited.	No. of cases.	Improved.	Unimproved.
1–18	66	43=65.16%	22 =33.33%	21	13=61. 9%	8=38. 1%
18+	40	20=50%	18=45%	24	6=33.33%	18=66.66%
Total	106	63=59.44%	40*=37.78%	45	19=42.22%	26=57.38%

* Three other cases died during treatment.

CONCLUSIONS.

Out of 151 cases of schizophrenia admitted, 106 cases were treated with insulin. Sixty-three (59.44 per cent) benefited by the treatment, 40 remained unchanged and three died during the treatment. In cases with a duration of illness less than six months, 17 (54.83 per cent) showed a good remission and seven a partial remission, thus giving a total of 24 (77.41 per cent) out of 31 cases which benefited by the treatment. Subacute and chronic cases benefited 54.28 per cent and 50 per cent respectively by the treatment. In these groups the majority of the benefited cases reached, however, only the level of partial remission. Recent cases and older cases with an acute flare-up give the best results.

Ninety-six cases were followed up: 36 cases for three to six months, 46 cases for 6 to 12 months and 14 cases longer than 12

* Two cases Cr, seven cases Sr.

months. The post-hospital course of cases treated showed that the paranoid type of schizophrenia responded best to the treatment. Catatonic cases were benefited by the treatment at about the same rate but did not seem to be able to hold the improvement as well as the paranoid group. No hebephrenic cases reached the level of complete remission following treatment and, in general, their number of good results was not as good.

Applying a rather strict yardstick in evaluation of the results, truly recovered cases seem to have little tendency to relapse, whereas cases with social or partial remission are in considerable danger of relapse (34.07 per cent) if discharged shortly after completion of the treatment. Altogether, 18 cases relapsed and 17 cases improved after discharged beyond the status at the time of discharge.

In comparison, the recent group showed 79.31 per cent immediate good results as against 62.07 per cent follow-up results. For the total material the respective figures were 61.45 per cent as against 50 per cent. Subacute cases responded in the long run the least favorably to the treatment.

Eighty-three cases were treated during their first attack, seven cases during both the first and the second attack, 16 cases had previous attacks out of which they recuperated without insulin. Three of them failed to respond to insulin during their present attack. Of seven cases previously treated with insulin only four responded favorably to a second course of treatment.

Cases older than 36 years responded less favorably to insulin.

The results obtained indicate a beneficial effect of insulin upon cases suffering from schizophrenia. Also the comparison of the results of the insulin treatment with 45 selected untreated cases admitted during the period covered by this study points in this direction.

Still more time is needed for an ultimate evaluation of the merits of the insulin treatment.

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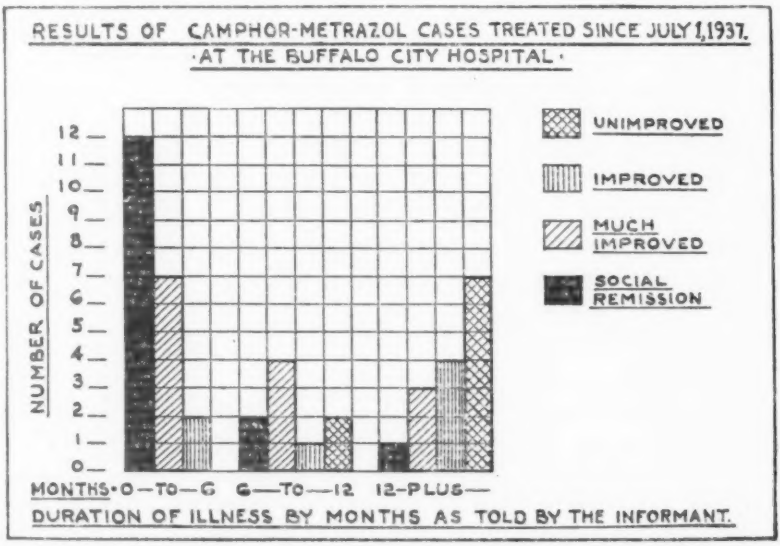
EXPERIENCE WITH THE CAMPHOR METRAZOL TREATMENT OF SCHIZOPHRENIA AT THE BUFFALO CITY HOSPITAL, BUFFALO, N. Y.*

By ALFRED L. C. ULRICH, M. D., Buffalo, N. Y.

The camphor metrazol treatment in schizophrenia was started about October 1, 1936. The results of the first 20 cases treated



were presented by Dr. Emerick Friedman at the 1937 meeting of The American Psychiatric Association. Of those original 20 cases, only three have relapsed.

Since July, 1937, under the writer's supervision 45 cases have completed the treatment. Of this group of 45 cases, 15 have

* Abstract of paper read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, Calif., June 6-10, 1938.

a social remission; 14 are much improved; seven are improved; nine showed no improvement.

Generally one course of the treatment as described by Friedman was found to be sufficient. Three patients improved only moderately after one course of treatment so that we felt a second course was indicated. Our deduction proved correct in two of these, who were ultimately discharged as social remissions.

When this report was written, we had administered a total of 1560 therapeutic convulsions at the Buffalo City Hospital. Two patients expired who had received camphor injections only. They did not present the textbook picture of camphor poisoning prior to death.

The follow-up of treated and discharged patients is of the utmost importance to promote rehabilitation and adjustment to the home environment. In most instances the family is ignorant of what is needed and must be guided by the psychiatrist. The tuberculous patient, emerging from a sanitarium, and his family are instructed in the rôles they are to play in the rehabilitation. Similarly, the schizophrenic's family must learn to encourage and stimulate the patient to prevent a recession to his former introverted state. Psychotherapy consisting largely of cathexis and some interpretation is useful in promoting a greater adequacy, and has in no instance been detrimental to the progress of the patient. The psychiatric social worker can be of inestimable value in facilitating this adjustment.

SHOCK THERAPY IN SCHIZOPHRENIA.*

By CHARLES W. MILLER, JR., M. D., Medical Lake, Wash.

Fifty-one patients were treated with insulin, according to the usual technique, and their progress has been followed for at least six months after the completion of treatment. The results, as evaluated immediately following the completion of treatment in each case, are shown in Table 1.

* Abstract of paper read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, Calif., June 6-10, 1938.

From the Eastern State Hospital, Medical Lake, Wash., and the New Jersey State Hospital, Trenton, N. J.

TABLE 1.

Duration of symptoms	0-1½ yrs.	1½-4 yrs.	over 4 yrs.
	Total per cent.	Per cent.	Per cent.	Per cent.
Complete remission	12-23.5	9-32.1	2-22.2	1- 7.1
Social recovery	4- 7.8	2- 7.1	1-11.1	1- 7.1
Improved	15-29.4	9-32.1	2-22.2	4-28.6
Unimproved	20-39.2	8-28.5	4-44.5	8-57.2

It is interesting to note that nine of these patients gave a history of a previous remission of symptoms, either spontaneous or attributed to some other form of treatment. No fatalities nor other untoward complications were encountered in this group.

At the end of six months, another evaluation was made of the condition of these same patients, with the results given in Table 2.

TABLE 2.

Duration of symptoms	0-1½ yrs.	1½-4 yrs.	over 4 yrs.
	Total per cent.	Per cent.	Per cent.	Per cent.
Complete remission	8-15.7	7-25	1-11.1	0- 0
Social recovery	8-15.7	5-17.8	1-11.1	2-14.2
Improved	10-19.6	6-21.4	3-33.3	1- 7.1
Unimproved	25-49	10-35.7	4-44.5	11-78.5

In order to have some basis for comparison, a group of controls was selected by starting with a patient who was admitted just prior to the last patient included in the group above, and then listing the 50 consecutive admissions before him, whose conditions were diagnosed as schizophrenia, and who received no treatment beyond custodial care, occupational therapy, casual psychotherapy, and the other general hospital measures, which were, of course available for the insulin patients also. The condition of these controls was tabulated after six months in the hospital, with the results shown in Table 3.

TABLE 3.

Duration of symptoms	0-1½ yrs.	1½-4 yrs.	over 4 yrs.
	Total per cent.	Per cent.	Per cent.	Per cent.
Complete remission	3- 6	3-25	0- 0	0- 0
Social recovery	8-16	3-25	4-28.5	1- 4.2
Improved	13-26	4-33.3	4-28.5	5-20.8
Unimproved	26-52	2-16.7	6-42.8	18-75

There are two factors which work in opposite directions, but which may render comparison with this group of controls inaccurate. First, the presence of a greater proportion of patients with symptoms of longer duration, and second the fact that patients who showed signs of marked improvement during the observation period were not given insulin therapy. The totals of unimproved patients in the two tables are almost identical.

For the purpose of further comparison it is interesting to use the statistics from a series of 100 patients, who were diagnosed as schizophrenia, and who were inoculated with malaria. This study

TABLE 4.

Duration of symptoms.....		0-1½ yrs.	1½-4 yrs.	over 4 yrs.
	Total per cent.	Per cent.	Per cent.	Per cent.
Complete remission	6- 6	6-26.1	0- 0	0- 0
Social recovery	7- 7	5-21.7	2- 5.1	0- 0
Improved	21-21	4-17.4	12-30.8	5-13.2
Unimproved	66-66	8-34.8	25-64.1	33-86.8

TABLE 5.

Duration of symptoms.....		0-1½ yrs.	1½-4 yrs.	over 4 yrs.
	Total per cent.	Per cent.	Per cent.	Per cent.
Complete remission	6- 6	5-21.7	1- 2.6	0- 0
Social recovery	13-13	7-30.4	4-10.3	2- 5.3
Improved	21-21	3-13	11-28.2	7-18.4
Unimproved	60-60	8-34.8	23-59	29-76.4

represents the effects of malarial therapy as carried out on a fairly complete cross section of the hospital population, for it was administered almost routinely, and little effort was made to select patients for the treatment. Only one fatality was encountered in the entire group. The results immediately following the termination of treatment, and the condition of the patients at the end of six months are shown in Tables 4 and 5, respectively.

Of the entire group treated, ten gave a history of previous spontaneous remissions.

In conclusion, then 51 schizophrenic patients were treated with insulin, 100 were treated with malaria, and 50 received no treatment. Analysis of the results thus obtained reveals very little

statistically significant difference. Although insulin therapy is valuable because of the ease with which the reactions can be handled, because it has a beneficial effect on the physical state of the patient, and because it may offer a helpful research approach to the nature of the schizophrenic reaction, it is felt that the general optimism concerning its effects is exaggerated and unwarranted, and that in time we will come to regard insulin as merely another method, to be used in selected cases, for rendering a patient accessible for all the other methods of treatment at our disposal.

EXPERIENCES WITH THE PHARMACOLOGICAL SHOCK TREATMENT OF SCHIZOPHRENIA.*

By GUY H. WILLIAMS, M. D., GUY H. WILLIAMS, JR., M. D., HELEN M. KINGSBURY, M. D., and DAVID E. BIXBY, M. D.,
Cleveland, Ohio.

In our application of the convulsive therapy, we have used camphor plus metrazol in some patients, and in others have employed metrazol alone. The treatment as outlined by Friedman [1] has been followed with only minor variations.

To date we have completed the treatment on 75 patients, and 10 more are now under therapy. Our results are based on the 75 cases, since insufficient time has elapsed to enable us to make any definite deductions concerning the latter group of 10. In studying this series, we have classified the results under three separate headings, namely: Improved, slightly improved, and unimproved.

Scrutinizing the records of the Cleveland State Hospital for the past 10 years, we find that only 5.18 per cent of the cases of schizophrenia have been discharged as improved. This figure represents improvement by routine hospital care, a degree of psychotherapy, occupational therapy wherever possible, and in

* Abstract of paper read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, Calif., June 6-10, 1938.

From the Cleveland State Hospital, Cleveland, Ohio, the authors wish to express their appreciation for instruction and help given by Dr. Emerick Friedman.

some instances, treatment directed toward the betterment of the endocrine function. While our 29.3 per cent improvement does not approach some of the reported results, it can be readily seen that this is a distinct advantage over the above described routine hospital treatment.

The 25.3 per cent group of slightly improved patients represents unmeasurable value in the hospital care of these cases and production of better institutional citizens. Finally, there is the unimproved group of 45.3 per cent which is higher than either of the others, but here the average duration of illness is 6.3 years, a figure which far exceeds the expectations of the treatment as outlined by de Meduna.[2]

The most serious and prevalent complication in our experience has been gluteal abscess formation which was encountered in five cases, all of whom had camphor. In addition, there have been numerous dislocations of the mandible and a few minor lacerations of the tongue. In several patients routine urine examinations indicated renal damage as shown by slight amounts of albumin, occasional casts and red blood cells. However, with the cessation of treatment these findings disappeared. Investigating the literature, we found no mention of camphor metrazol producing renal changes except in doses greater than those employed. It was believed, therefore, that the above noted urine changes were probably the result of the convulsive state alone. During camphor treatment it is common to find the urine reducing Benedict's solution. It was first thought that the change was due to the presence of sugar, but further investigation revealed that it was caused by the excretion of glycuronic acid in combination with camphor.

Summary and Conclusions.

The results obtained in the treatment in 75 cases of schizophrenia of long standing fully justify the use of such procedures in our state hospitals. Social recoveries to the degree of permitting even temporary release from state care is of great significance. The improvement in the psychological picture with resultant better conduct in those who must remain institutional citizens reflect its

value not only in the happier lot of the individual patient, but also from the economic standpoint as well.

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DISCUSSION.

DR. APPLETON H. PIERCE (Coatesville, Pa.).—I have been asked to make a brief statement of the experience of the Veterans Administration of the Federal Government.

Because it treats veterans only, our patients are almost entirely males seldom under 38 years of age, the average age being about 46. As an exception, very rarely a patient is received from the regular Army or Navy. Therefore, most of our præcoxes are of long duration, a group generally regarded as unfavorable for treatment. In spite of this fact, treatment has been widely applied.

We have had a few dramatic remissions where no evidence of the previously existing psychosis can be found. It is too early to call them cures, although many using this form of treatment might so list them. Mental improvement has occurred in a large number of cases, shown chiefly by improved adaptation, in many instances warranting trial visit. There is generally a lessening of psychotic manifestations, although there is a considerable group who have shown no improvement. An increase in weight with a bettering of physical condition is the universal rule. Probably thus far our most noteworthy observation is the improvement shown in many cases, even of ten or fifteen years' duration. In general, increased accessibility, interest and insight seem to occur in that order in the case favorably influenced. As yet our experience does not justify the drawing of arbitrary lines as to particular types of schizophrenic reaction which should be treated.

Our experience with metrazol and with metrazol combined with insulin is more limited. Thus far the results have been much the same as with insulin alone. In some cases, uninfluenced by insulin, metrazol has proven of value. We cannot be unmindful of the hazard involved.

I believe our medical officers are recognizing the value of a hopeful and encouraging attitude toward the patient; that an honest effort should be made to satisfy newly aroused interests; that physiotherapy, physical training, occupational therapy and short leaves are adjuvants, and that the doctor should be flexible, rather than institutionally rigid.

Speaking as an individual, I wonder if perchance the efforts to analyze the factors involved in insulin therapy are not driving us with increasing force to recognize the values of closer personal interest in the particular patient, of an active, flexible and sustained therapeutic effort, and of optimism, enthusiasm and encouragement. If recognized, will we psychiatrists have the interest and energy to make the necessary effort and will suitable facilities be granted by the public to make the effort possible? Are we about to enter a new era in public institutions where such an approach will become the rule? On humanitarian grounds, no justification is necessary. Possibly the future will prove it advantageous on economic grounds as well.

DR. HORACE GRAY (San Francisco, Calif.).—When series are small but exhibit like tendencies, pooling may be legitimate and afford numbers large enough to warrant application of probability. For criterion divide the improved by the number observed to get the probable proportion improved. For acute controls, for example, 68 per cent, with a standard error of sampling of six per cent, indicates that *56 to 80 per cent* may be expected merely by chance. For insulin-treated we pool the ten series reported at Berne, 1937, and San Francisco, 1938, by Beno, Frostig, Harris, Katzenelbogen, Kubo, Marzynski, Miller, Müller, Press, Roemer; the 74 per cent improved in the acute hardly proves success of treatment in this group of short duration, but the proportion *42 per cent in the chronic* supports the conclusion of success in schizophrenics sick more than 18 mos.

Authors.	Acute, under 18 m. Impr./N = p ± SE.	Chronic, over 18 m. Impr./N = p ± SE.
Control pool (Harris + Miller)..	28/56 = .68 ± .06	39/139 = .28 ± .04
Range ± 2 SE.....	.56-.80	.20-.36
Insulin-treated pool (10 authors).	478/648 = .74	189/452 = .42

DR. MANFRED SAKEL (New York, N. Y.).—I have very little to add to the excellent paper given by Dr. Ross. My position with regard to this subject is somewhat difficult, as I am afraid that an over optimistic attitude on my part might be subjectively interpreted; for no one would expect me to be severely critical of a method which I have inaugurated myself. However, I should like to call special attention now to something which I have already stressed, though apparently not emphatically enough, in previous lectures.

It is not primarily a therapy of schizophrenia which I want to suggest, and which I have widely advocated; it is, rather, a new approach to psychiatry, a more medical approach, if I may put it that way. In dealing with facts observed during the treatment of psychoses, I want to bring psychiatry once more into closer relation to medicine, or, if you wish, to bring medicine more into psychiatry.

I manifested this desire years ago in Vienna, when I founded a seminar at the University of Vienna for the study of the pathophysiology of psychoses. I intended to revive in psychiatry the working hypothesis that the physician who deals with psychotics should treat the psychosis as a symptom of the disease, and not as the disease itself.

As long as we contented ourselves with the assumption that the psychic phenomena constituted the actual disease, we had no incentive to investigate the cause of the phenomena in the living organism.

I want to express clearly once more a fact which should have been known always: that the psychic (and mental) phenomena connected with thinking and feeling cannot be isolated as the only objects of study. Not only must they be connected with the soma of the individual, but they must also be considered as representative of the function or dysfunction of the highly developed human organism. This conception, now, as ever, recognizes the proper psychological factors and influences in the social life of the human

being, which, in the course of development, have become inseparable features and characteristic attributes of the individual.

Furthermore, the importance of the observations made in connection with therapy lies in the fact that the physician who deals with psychotics, especially those in institutions, must not only treat the patient, but is at the same time confronted with so many unsolved problems, that he is stimulated to make further investigations, and brought closer to the solution of these problems.

I have tried to supplement the pathobiological theory of Adolf Meyer with a pathophysiological one, thus summing up the whole theory of psychoses. And I wish to close this discussion with an expression of my hope that the treatment inaugurated by me will not only develop further as a treatment, but also that it will help more institutions for the insane to become hospitals for the sick, and more physicians in these institutions to become true scientific research workers. It is precisely at this time and in this country that my hopes for success in attaining this second goal fill me with a great sense of satisfaction and of achievement.

I should like to mention briefly the findings of my further researches, which, at the present time, have dealt mainly with the treatment of schizophrenics of long standing. Such patients constitute the greatest percentage of the inmates of institutions for the insane. As I have not yet completed these researches, they cannot yet serve as a point of departure for reliable generalizations on the subject, as can the observations made during the treatment of earlier cases. I have been delayed partly by the nature of the work itself, and partly by external circumstances which have cut down my field of activity. In any case, I can state that the exaggerated pessimism with which I at first regarded these cases has proved itself more and more to have been unjustified.

In a series of so-called "outcome" investigations, I found I could produce substantial changes, and even make a certain social adaptability possible. Although I have only been able to do clinical research work, because I have no laboratory or co-workers, the continued effectiveness of the protracted shocks and protracted treatments still seems to point in the direction which I have indicated in previous papers on the subject.

In cases which have been unaffected by other methods a protracted or a so-called condensed shock has often proved efficacious. The condensed protracted shock consists of provoking a convulsion in a comatose patient with a small dose of metrazol during the fourth hour of the coma, when he is just on the verge of a late convulsion. The patient then wakes spontaneously, and, if desired, may even be left two hours longer in the coma. The fact that I have effected improvements just as easily in patients who have only undergone the treatment two or three times, as in those who have been treated over an extended period points to the conclusion that an amnesia for the psychosis—figuratively speaking—is produced. Physiologically expressed, this means that in such cases we deliberately produce slight injuries to the brain cells, and, by destroying the dominating pathological cells, we assist the dominating

healthy cells to break through between those sections which have been producing the psychotic personality.

It is also possible to arrest the functioning of the diseased cells, instead of, as in the early cases, seemingly changing the diseased functioning to normal functioning. These are merely hypothetical explanations of the clinical observations I have made, and I hope that through cooperation with others interested in the subject, and with laboratories and institutions, more light will be thrown on this complicated problem. Doubtless, next to the dysfunction of the brain cells, the imbalance of the endocrine glands also plays a prominent part, and can even effect an imbalance of the whole personality. This, in its turn, will affect the dysfunction of the cells. It seems that all these factors must be considered in relation to the treatment.

CORRELATION OF INSULIN SHOCK AND CONVULSIVE STATES RELATIVE TO SYMPTOMS AND SITE OF GREATEST DISTURBANCE IN THE CENTRAL NERVOUS SYSTEM.*

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The wealth of motor manifestations seen in patients being treated by insulin shock for dementia præcox offers a field excellent in quality and wide in scope for study of abnormal motor mechanisms released by the central nervous system during the various stages of shock reaction. Studies have been made by the writers on 29 patients receiving 60-plus patient months of treatment, a total of 1500 insulin shock reactions. Aside from the psychiatric and other clinical considerations, particular attention was directed to the motor phenomena, and especially the similarities and differences of the convulsive symptoms in comparison to those of "epilepsy." An attempt was also made to correlate the observed movements so far as possible with disturbances in different locations in the central nervous system.

Before presenting the material upon which this work is based, a few introductory explanations should be made. The patients were being treated primarily for their own benefit and with the objective of returning them to society. With the welfare of the patients the paramount consideration, prolonged periods of observations were not so frequent as they could otherwise have been, and what might have been an excellent experiment was often aborted by the administration of glucose to relieve the patient who was approaching a dangerous situation.

Of the patients treated the ages varied from 17 to 48 years, and all were free from any evidence of organic disease of the nervous system. Insulin was given in shock doses six days per week according to the method of Sakel, but with some modifications that we

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have considered advisable. The individual tolerance of each patient was determined, and the daily dose of insulin given varied from 10 to 450 units. The reactions were terminated from four to six hours after the insulin was given except in emergencies when it was terminated earlier. The average result was a state of profound unconsciousness which it was necessary to end by giving glucose by nasal tube, intravenous injection, or both.

As has often been noted by others, it was impressive to observe not only the great variability in the amount of insulin tolerated by different patients, but also the variability of each patient on different days to uniform doses of insulin. Each patient tended to manifest certain characteristic types of reaction, but even these varied from day to day in the time and mode of onset and in the progression of symptoms. One patient would go into a quiet sleep without any excitement or unusual movement; another would have as his first symptoms severe myoclonic jerks involving all parts of the body; a third would have first an epileptiform seizure. Some of this variability seems related to the dose of insulin. If only a small amount is given most patients will go to sleep quietly; while if a large dose is regularly given in one injection the quiet period is shortened so that some severe reaction develops suddenly.

Disturbances of Consciousness.

Because there seemed to be a certain relationship between the different motor symptoms and the varying states of consciousness during the reactions, an effort was made to determine these relationships, and observations were made in regard to the degree of lethargy or coma at the time when the particular motor patterns developed.

When the tolerance of the patient had been ascertained, it was the aim of each treatment to produce a state of coma. This developed gradually, as a rule, beginning with drowsiness or mild lethargy and progressing through several more or less distinct phases. The sequence frequently varied and patients would at times become more alert after a period of stupor, only to lapse into stupor again. Mental excitement or exhilaration sometimes preceded or followed the drowsiness, and more rarely interrupted the stuporous states.

Exact determinations were not easily made in regard to the variations in the disturbances of consciousness, primarily because

in the earlier stages of treatment the patients were psychotic, negativistic and uncooperative even when they were not in a state of hypoglycemia. During the later stages of treatment most of them were cooperative, and better observations could be made. The criteria used for the determination of the state of consciousness included: (1) The alertness of the patient in relation to his environment; (2) his responsiveness to questions, requests and orders; (3) the occurrence of spontaneous movements of voluntary or purposeful type; (4) reflex reactivity of tendons, skin, pupils, and cornea; and (5) the period of amnesia, which was ascertained by questioning the patient after recovery.

For the sake of convenience the disturbances of consciousness have been divided arbitrarily into four stages, viz.: (1) The early stage of drowsiness in which the patient takes some notice of things about him and is able to converse in a superficial manner; (2) lethargy from which the patient can be aroused to answer in monosyllables or even to converse a little: (3) stupor, in which the patient reacts reflexly to sensory stimuli and performs movements of voluntary or purposeful patterns but aimlessly or without evidence of thought or purpose; the eyes are often wide open staring into space; (4) coma with loss of cutaneous pupillary and corneal reflexes, and stertorous and sometimes Cheyne-Stokes respiration.

After recovery of consciousness amnesia is usually complete for the entire period of reaction except in the beginning of the first period of drowsiness. Recovery of consciousness is commonly rapid and uneventful, but may be slow and characterized by a reversal of the progression of onset. The patients recall having been sleepy and emotionally indifferent in the first stage, and of experiencing a brief period of dream-like confusion occasionally accompanied by mild anxiety during recovery.

Motor Disturbances.

One of the most characteristic features of the reaction to insulin was the profusion of motor phenomena, and the variations of patterns of reactions and the intensity of their manifestations. For the purpose of analysis the motor symptoms have been classified into two main groups, viz.: (1) Disturbances of normal voluntary movements in which the main patterns of movement were of the

voluntary type but without necessarily showing evidence of purposeful adaptation; (2) abnormal movements and changes in muscle tone where the motor patterns were purposeless. During the stage of drowsiness and when aroused from sleep, patients often showed ataxia and inadequacy of movements which were normally adaptive in type; speech was thick, swallowing at times difficult, water was spilled from a glass in attempting to drink, and equilibrium was disturbed when the patients sat up in bed. The movements resembled rather closely those of alcoholic intoxication. In the later stages, quiet stupor was often interrupted by active or violent movements which appear voluntary but were aimless and abortive. The patient tossed about in bed, kicked off the covers, seized objects and then let go of them, started to get out of bed without actually doing so. Each movement was fairly well coordinated and strong but the whole series was disconnected and purposeless, and the patient appeared to be almost completely undistractible and oblivious to his environment. Pouting movements of the lips and grimacing were very frequent, especially in the early stages, and appeared to be dissociated from any conscious or emotional process. Incontinence of urine and feces, indicating loss of voluntary control, occurred a number of times while patients were at least to some extent aware of their surroundings.

Abnormal Movements.

The list of abnormal movements which occur during insulin shock is extensive and includes: myoclonus; athetosis; conjugate deviation of head and eyes and other torsions; nystagmus, strabismus, and wandering and dissociated movements of the eyes; irregular fixed attitudes of the limbs and body; general clonic and tonic convulsive movements of prolonged duration which at times appear to contain a quasipurposeful element; irregular respiratory movements, and rarely typical Cheyne-Stokes respiration; episodes of generalized convulsions coming on suddenly and lasting from one to two minutes. These conform closely to the type of grand mal epileptiform episodes.

None of the patients of this series exhibited typical jacksonian symptoms, the nearest approach being conjugate lateral deviation of the head and eyes which was usually a part of general torsion movements. It should also be stated that there was no hemiplegia,

hemianopia, or aphasia, either during the hypoglycemia or as residuals. Shivering did not occur even when a patient was wet with perspiration and the rectal temperature less than 94° F.

Myoclonic movements were observed almost uniformly in all patients during some stage of each shock reaction. These movements are characterized by extremely quick jerks followed by immediate relaxation of the muscles involved. They frequently appeared while the patient was still awake, and usually began in the muscles of the face, soon spreading to the arms and later to all parts of the body. While still localized they were irregular and asymmetrical in their distribution, but as they became general they tended to affect bilaterally symmetrical muscle groups synchronously, and ultimately the entire body of the patient would be involved in violent myoclonic spasms which affected all muscles synchronously and recurred at frequent intervals. In a typical picture of generalized myoclonia with synchronized movements, the eyes closed with each jerk, the arms were thrust forward (upward when the patient was recumbent), the abdominal muscles contracted so that the body bent forward and the knees were raised.

During the insulin reactions the state of general muscle tone varied between wide limits, from complete flaccidity to severe tetanic rigidity. The most marked hypertonia commonly occurred in the stages of stupor and coma, but could appear at any time, and occurred in periods alternating with periods of relaxation. The muscle rigidity often involved only a part of the body, the arms more frequently than the legs, and even the proximal muscles of the arms leaving the wrists relaxed. The unequal distribution of the hypertonia is indicated by the various fixed attitudes, as flexor or extensor positions of the extremities, opisthotonos, torsions, and the decerebrate picture exhibiting the phenomena of Magnus and de Kleyn. In the phases of hypertonia practically all movements were of a convulsive type (torsion spasms, clonic convulsive movements, tremors and athetosis).

With the advent of muscle hypertonicity the myoclonic jerks relaxed less promptly and ultimately assumed the characteristics of clonic contractions rather than typical myoclonia.*

* The idea suggests itself that the essential difference between myoclonia and clonic movements is the presence of myotonia in the latter. When myotonia is at a maximum the patient is in deep stupor, all muscles in a

About half of the patients treated exhibited acute convulsive attacks coming on suddenly with tonic phase followed by clonic movements, and lasting from one to two minutes. These conformed closely to the typical major "epileptic" fit. They have appeared at various stages of the insulin reactions; one occurred early in the first stage and another during a mild secondary insulin reaction, but most of them developed during the later stages of the shock periods. There was nothing in the available history of any of the patients to indicate a personal or hereditary predisposition to convulsive attacks.

There is remarkably little to report in respect to abnormal reflex reactions of the patients under the insulin treatment. The tendon jerks showed little variation; they were, however, difficult to evaluate during the phase of hyperkinesis but were increased with hypertonia. They disappeared when the patients were in deep coma as did all of the other reflexes. The Babinski and other pathological toe signs commonly appeared in the later stages, but were sometimes present early. The pupils were often contracted when patients were in quiet stupor, but would dilate suddenly with the onset of motor activity. In deep coma the pupils were wide and did not react to light. The loss of the corneal reflex was a convenient and valuable sign in determining the depth of coma.

To give a general conception of the clinical manifestations exhibited by different patients a brief generalization of several case histories is presented.

J. F. nearly always became first drowsy, then developed myoclonic twitching of the face and jerking of the head. This soon spread to become a generalized myoclonus with thrusting of the arms forward (upward) and the rest of the body became involved. Drooling usually appeared. In some of these myoclonic attacks all muscles would become stimulated at once. In one period the biceps and triceps muscles contracted at the same time. This flexed the arms slightly. The pectorals contracted drawing the arms medially but the pattern mechanism included the serratus anterior which thrust the arms forward. The flexors and extensors of the wrists contracted but resultant action was extension. The knees were raised off the bed only about

state of tetanic rigidity. The teeth are tightly clenched, respiration is stertorous with evidence of laryngeal spasm, the mouth full of ropy saliva with bubbles from the lips. This condition is in reality a major convulsive episode, but it differs from the typical epileptiform fit in that it is only a cross-section of the tonic phase of the latter and tends to continue indefinitely until the patient is given glucose.

four inches each time; the heels remained on the bed. Extensor movements of the great toes occurred each time. The abdominal muscles contracted, bringing the head and shoulders forward. The upper eyelids flexed somewhat at each movement. The patient was too stuporous to respond and usually, but not always, Babinski signs were present during the attack. This was repeated with a few seconds intermission for 20 minutes. Sometimes these were limited to the upper limbs. In some instances consciousness was retained, in others lost. Even when conscious, the patient usually was unable to speak during the attack. After a short lapse of this form of reaction the patient nearly always went into a state of rigidity of the extensor type, though Magnus and de Kleyn reflexes were never obtained in his case. Sometimes the upper limbs alone were affected, in most instances all four limbs were rigid in extension. In extensor rigidity the Babinski sign had disappeared.

Beh. almost invariably showed drowsiness first, occasionally excitement. Almost regularly the next symptom was bulbar paresis, though at times bulbar stimulation and grimacing appeared. Drooling and thickness of speech came next and this would gradually go over into unconsciousness. After consciousness was lost torsion spasm or spasms of extensor rigidity supervened in which at times only the upper limbs were involved.

B. V. was always drowsy first. Then followed myoclonic twitching about the face or grimacing. Her case was characterized by eye symptoms, especially by the appearance of Parinaud's syndrome of dissociated eye movements. She also had downward deviation of the eyes with a staring expression. Myoclonic jerking of the generalized type without loss of consciousness occurred twice. At other times the usual generalized myoclonic jerking of the body took place followed by loss of consciousness.

M. J. E. was peculiar in that with the initial drowsiness there was usually bulbar paresis. The patient complained of inability to swallow and saliva drooled from her mouth though she was having only a light reaction. This was soon followed by grimacing and generalized myoclonus after which she lapsed into coma.

Margaret B. was treated for four months. During the first course she was regularly drowsy first, then showed bulbar symptoms, myoclonic twitchings and eye signs. She had dissociated eye movements and downward deviation of the eyes with a staring expression. The latter period of her treatment was characterized by a new eye symptom—strabismus, wide palpebral fissures, and severe major myoclonic attacks while still able to answer questions. The picture was reminiscent of delirium tremens. The arms were jerked forward, diaphragm and practically all muscles were affected, even those of the throat so that when the patient attempted to speak during an attack her speech was jerky and irregular. Her wrists were usually flaccid so that her hands flapped; the abdominal muscles contracted so that her body was bent forward and lower limbs were raised from the bed. Sometimes these came as the first symptom and after complete recovery from it the patient would lie quietly before going into coma an hour later.

L. M. usually began her reaction with tremors and jerking of the head. About half of the time she was simultaneously drowsy. Then followed excite-

ment, generalized myoclonus and bulbar symptoms. She had eight of the severe generalized myoclonic jerking attacks without loss of consciousness with flapping of the hands etc. One of these occurred as a secondary reaction to which she was subject. She also had one generalized epileptiform seizure and conjugate deviation of the head and eyes on several occasions. Decerebrate rigidity occurred three times.

Miss H. reacted almost regularly with fractional epileptiform seizures with trismus, profound loss of consciousness, suffocation, cyanosis and apnoea. Then she regained consciousness only to repeat every ten minutes. She had not less than 30 seizures, more than all the other patients combined.

J. M. C. was unlike the others in that she showed excitement almost regularly. This was part of her general personality, however. It was almost the rule for her to have manifestations resembling major hysteria. She would throw her limbs into the air and toss herself about the bed in the manner characteristic of Charcot's patients. These were preceded by drowsiness and followed by coma.

P. Vr. after a period of drowsiness would become excited or quietly go into coma. During the transition there were usually grimacing or bulbar symptoms. He complained also of being unable to see. He said, "I can see but I don't have my brains." This is reminiscent of mind-blindness, but general cerebration was not sufficiently clear to establish definitely such a diagnosis.

Correlation of Symptoms with Sites of Greatest Disturbance in the Central Nervous System.

In general the symptoms referable to the nervous system appearing in hypoglycemia may be considered to be due either to the impairment of normal neural currents or to abnormal nervous discharges indicating pathological irritability (or possibly so-called "release phenomena" resulting from the withdrawal of inhibitory control). Lack of knowledge in regard to the nature of the fundamental processes of neural physiology and especially of the mechanism of neural inhibition makes the problem of analysis of clinical manifestations a difficult one. It is of interest, however, to correlate so far as possible the symptoms of hypoglycemia with disturbances of function in more or less localized areas of the central nervous system. In problems of localization the character and extent of the lesions is of importance; the smaller and more discrete the lesion which causes a symptom, the more its value in localization. In hypoglycemia the "lesion" is obviously extensive and diffuse, and also incomplete in that it is quickly reversible. The biochemical changes in the nerve cells which occur in hypoglycemia

are little known, but the most obvious fact is that they are deprived of their usual supply of glucose which is necessary for their normal function. Attention has been called by others to the similarity of the symptoms of hypoglycemia and those of anoxemia, and the suggestion is obvious that a deficiency of the supply of either glucose or oxygen may interfere with the oxidation of carbohydrate in the neuron. The changes in the cells are reversible up to a critical point in both anoxemia and hypoglycemia, and beyond a certain point they are irreversible and cell degeneration follows. It is possible that many nerve cells are destroyed in the severe and prolonged insulin shock reactions incident to the treatment of schizophrenia, even in cases in which the results are, on the whole, favorable.

Consciousness.—As in "epilepsy," some impairment or alteration of consciousness is the most constant and prominent symptom of insulin shock. Drowsiness is the first sign of reaction and profound coma the last. Patients are almost invariably amnesic for the entire period of reaction, even when they converse and appear to be conscious. Since the areas controlling the sleep and wake functions and the manifestations of physiologic or primitive consciousness appear to be parts of the same mechanism, and accumulating evidence indicates that they are located in the hypothalamus, it seems certain that this region must be profoundly affected by hypoglycemia. The hypothermia and drenching perspiration may also be explained by disturbances in the hypothalamic centers of the vegetative nervous system which regulate these processes.

Impairment of Voluntary Movements.—Dysarthria and dysphagia occurring when consciousness was relatively unimpaired, appeared to be of the bulbar type, and were ascribed by us to disturbances in the medulla. Puckering of the mouth, grimacing, sucking movements and protrusion of the tongue also appeared to be of medullary origin, possibly from irritation of the reticular structures in this region. Irregular respiration, sighing and yawning, and Cheyne-Stokes breathing indicate disturbances in the respiratory center (which also belongs to the reticular formation). General motor incoordination, similar to that of acute alcoholism, is strongly suggestive of cerebellar ataxia. Incontinence of urine and feces may be ascribed to irresponsibility of the patient, which may be due to his psychosis or to a disturbance of consciousness,

rather than a local effect on the sphincter centers. The aimless and abortive movements which may be active and at times violent, but are composed of normal voluntary patterns, are difficult to analyze. It would appear that these movements are abnormal only in so far as they are not directed by consciousness to a purpose. It is probable that they are not due to direct involvement of motor mechanisms, primarily, but to the undirected excitement during stupor. Whistling and the production of primitive singing sounds are in the same class.

Involuntary Movements.—Various involuntary ocular movements were observed including horizontal and vertical nystagmus, conjugate lateral and downward deviation, slow wandering and dissociated movements, convergent and divergent strabismus, and skew deviation. With the possible exception of the conjugate deviations these ocular movements reflect disturbances of the supranuclear ocular mechanisms of the reticular formation of the mid-brain and pons since there was little or no evidence of paralysis of individual ocular muscles, nor of cortically directed action. The extreme and often rapid variation of the size of the pupils independent of any change of illumination indicates instability of the reflex mechanisms of the pupil in the mid-brain.

Myoclonic twitchings, local and general, have been ascribed to motivations from different parts of the nervous system, including the motor cortex, pyramidal system, and (various parts of the) extrapyramidal system. The best interpretation seems to be that they are motivated from the extra-pyramidal system, and most probably from the reticular formation in different parts of the neuraxis and the dentate nucleus. Localized twitchings of the limbs and trunk may be explained by impulses discharged from various areas of the spinal cord; those of the face by discharges released near the nuclei of the facial nerve in the medulla. The violent jerks, affecting all of the muscles of the body synchronously, are evidently motivated from the upper part of the brain-stem in the region of the red nucleus and spread over the entire reticulospinal tract.

Since hypertonia accompanies a number of the convulsive movements and to an extent determines their character, it should, perhaps, be considered before discussing the abnormal movements of which it is a factor. Hypertonia may occur at any stage of the

insulin shock, but most commonly in the later periods. It may be localized or general, appear and disappear either gradually or suddenly, and tends to produce more or less characteristic attitudes as lateral deviations, opisthotonos, and extended or flexed positions of the limbs. Clenched fists and trismus are common, but an arm may be rigid only in the proximal portion, with the wrist and hand relaxed. Coarse tremors may complicate general hypertonia, and convulsive movements often develop when it is present. The clinical picture of decerebrate rigidity has developed in our patients at times, and represents the extreme degree of hypertonia. Definite manifestations of the Magnus and de Kleyn phenomena have been observed a few times.

In regard to the location of the disturbance responsible for hypertonia, it seems reasonable to place it in the mid-brain, at least where the condition is general as in decerebrate rigidity. Where the lower limbs only are affected the disturbance may be located in the spinal cord. Rigidity localized to a portion of both arms is not easy to analyze but may be due to disturbances in the striatum or the dentate nucleus.

The abnormal movements which occur while hypertonia is present include: athetosis, torsions, and generalized clonic convulsions. The latter may develop to a degree resembling epileptiform attacks. The athetosis and torsion movements tend to merge or to alternate, and to appear to be related in regard to their motivations. The striatum, or at least the striatal system, is probably the seat of trouble in the production of these particular movements. Clonic convulsions have impressed us as closely resembling a rapid series of myoclonic movements, but differing in that they do not relax completely between the individual jerks as does myoclonia. We have observed generalized myoclonia change into clonic convulsions coincidently with the development of hypertonia and have come to regard the clonic movements as an extreme manifestation of myoclonia complicated with hypertonia. This conception is supported by the fact that both the hypertonia and generalized myoclonia may be the result of lesions of the same region, viz., the mid-brain.

Cerebellar Fits.—We have repeatedly observed the development of opisthotonos with the arms flexed and the legs in rigid extension, and irregular, arrhythmical jerking movements, the total

picture closely corresponding to the so-called cerebellar fits described first by Hughlings Jackson. In the reported cases lesions have been described in the vermis of hemispheres of the cerebellum, but apparently always involving the dentate nucleus. In laboratory animals, the extirpation of the cerebellum commonly causes opisthotonos and hypertonicity as early symptoms (Fulton). We do not feel that the symptoms observed in our patients can be ascribed definitely to the cerebellum, but the close similarity of the motor pattern to those described in cases of cerebellar lesions seems worthy of mention. Although the cerebellum is in itself not directly concerned with muscle tonus, its connection with the red nucleus and the reticulo-spinal tract offers a possible pathway by which hypertonia might be excited.

Epileptiform convulsions, closely resembling the classical major fits of epilepsy, have developed suddenly in different patients at all stages of the insulin shock treatments. The definite sequence of tonic and clonic convulsions followed by relaxation after a brief time are quite at variance with the usual motor manifestations of hypoglycemia, although the individual items of the picture are common. It would seem as if the epileptiform episode resulted from an explosion of impulses in a complete discharge and temporary release of tension, in comparison to the less explosive but more continuous nervous discharges responsible for the more common tonic and clonic movements, and that the same areas are predominantly involved in both, viz., diencephalon and mesencephalon.

Discussion.

From our observations of the phenomena manifested in patients while they were in insulin shock, we have been impressed by the weight of evidence indicating disturbances of function in the basal region of the brain and in the brain-stem. Impairment or loss of consciousness, altered vegetative activities, decerebrate rigidity, various ocular movements, dysarthria, dysphagia, laryngeal spasm, and respiratory irregularities are particularly impressive in this respect. We were also impressed and surprised by the scarcity of symptoms which could be definitely and directly ascribed to cortical disturbances, in either the motor, sensory, or psychic fields. In some cases the conjugate deviation appeared to be of cortical origin, while in others it seemed to be a part of general torsion movements

motivated by lower centers. Rarely were unilateral movements of the face or the extremities characteristic of jacksonian convulsions observed. Two patients after recovery from shock stated that they had been unable to see clearly or to understand what they saw. This might be interpreted as due to cortical disturbance, but also possibly to a partial impairment of consciousness or involvement of the visual tract at the thalamic level. No definite symptoms of aphasia, agnosia, or apraxia were seen, but this is not surprising since these conditions can only be diagnosed when the state of consciousness is relatively clear.

Many of the symptoms of cortical involvement from hypoglycemia reported in the literature have been residuals which have remained for variable periods after the recovery from shock, and may be due to cortical impairment of greater degree than the usual, quickly reversible changes.

The scarcity of symptoms of cortical involvement in insulin shock may possibly be explained by the fact that cortical functions can proceed normally only when physiological consciousness exists; and also it is probable that the obvious predominance of disturbances in the basal region masks the irritative and deficiency symptoms referable to the cortex which might otherwise manifest themselves.

The psychic manifestations of insulin shock, including periods of confusion, of excitement, and of mental states more rational than before and after the shock period, must be interpreted with due consideration of the activity and content of consciousness especially in view of the fact that patients seldom remember what they have said or done during the insulin reaction. The more organized psychic activities for which the patient is later amnesic might be compared to somnambulisms or fugues, or even to states of so-called dissociations of personality. In this connection it is interesting to consider how closely similar are the psychic manifestations of insulin reactions to those often seen in epileptics.

We have thus been led most unexpectedly to the conclusion that practically all of the manifestations observed in these cases could be the result of action on, or release of, the basal region of the brain. The basal ganglia, brain-stem, and cerebellum are the sites to which lesions are usually ascribed to explain symptoms such as these observed in these cases.

When Sakel produced his monograph (1935) he ascribed most of the manifestations to the frontal lobes of the brain. He laid great stress on the moria and forced grasping. He also thought he observed that in right handed persons the left cerebral hemisphere was affected earlier and more strongly. He considered his observations on the mouth movements as showing a phylogenetic regression, the grimacing and sucking movements being primitive manifestations of what later becomes speech. Symptoms referable to the extrapyramidal tract were thought to appear in general only after the forced grasping.

Coarse rhythmic tremors reminiscent of paralysis agitans and choreic jerks of a transient character are essentially the only symptoms which are referred by Sakel to the extrapyramidal system.

Angyal (1937) following and working in the same clinic as Sakel also ascribes most of the symptoms to the frontal lobes. He even states his subtitle to be a "Contribution to the physiology and pathology of the human frontal lobes in the insulin treatment of schizophrenia."

We have observed what Sakel has called forced grasping and moria but see a different interpretation. The forced grasping seems to be part of a general motor unrest and the moria a part of a general psychic stimulation with euphoria. The torsion which is referred by the above authors to area 6 of Brodman (frontal lobe) impresses us as distinctly referable to the basal ganglia and brainstem, especially as it is often first unilateral and later bilateral, becoming opisthotonos. Much of what they consider convulsion is to us myoclonia as already outlined. In our cases symptoms which might be referred to one side or other of the brain have more often been referable to the right than the left.

A brief résumé of the literature is presented to show what we consider consensus of opinion regarding the localization of lesions which can cause the symptoms which we have observed.

Wilder (1930) studying cases of spontaneous hypoglycemia also reviewed the literature and pointed out that in decerebrate animals in which the hypophysis was also separated hypoglycemic convulsions appeared as before. He cited Kleitmann and Magnus as having shown that the cerebrum, thalamus, anterior half of the mid-brain and labyrinth were unnecessary to production of convulsions. He indeed concluded that the medulla and spinal cord sufficed. Wilder described as having been observed in spontaneous hypoglycemia practically all the symptoms we have recorded.

Concerning the most constant of the motor phenomena, the myoclonic jerkings, the following is presented as opinion of investigators: Bonhoeffer (1936) after a review of the literature states that long-continued myoclonus without epilepsy has shown anatomical findings most constantly in the central tegmental fasciculus. He also points out that in myoclonic epilepsy the specific inclusion bodies occur predominantly in the extrapyramidal system, dentate nucleus, subthalamic region, thalamus, pallidum and red nucleus. They are very rarely found in the cortex or Betz cells.

Stertz (1936) says in his discussion of the pathologic anatomy of the myoclonic syndrome, "A review of the entire material shows that the causative lesion underlying the myoclonic syndrome may be in different portions of the extrapyramidal system. We find affected the basal ganglia, especially the corpus striatum, substantia nigra, the brain-stem especially in the tegmentum, the cerebellum and its connections especially the nucleus dentatus and the olives; these are the sites of the lesions."

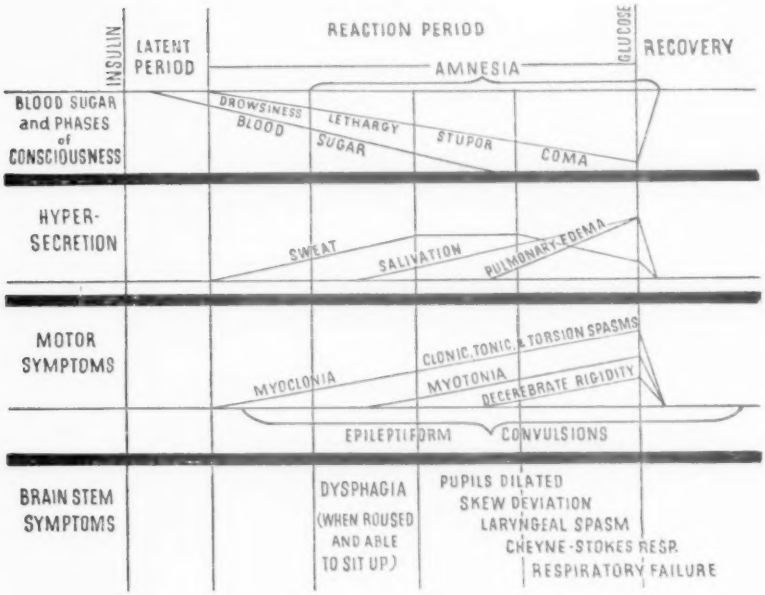
Lotmar (1936) agrees entirely with Stertz, and Davidson, Riley, and Brock in discussing rhythmic myoclonus of the palate, larynx and other regions say, "From a study of this instance and those previously recorded it may be concluded that the lesion which permits the appearance of these myoclonic movements is usually confined to the ipsilateral central tegmental tract and the ipsilateral inferior olivary nucleus. In a few cases the lesions were situated in the dentate nucleus and contralateral inferior olivary nucleus."

Golden (1937) after an excellent description of the motor manifestations states, "There were recognizable hemiplegic attitudes, extrapyramidal manifestations of transitory cog-wheel rigidity, and signs of mid-brain involvement in disturbed extra-ocular movements—the eyeballs moving asynchronously. There were also signs suggestive of disordered thalamic and medullary control of temperature, pulse and respiration. . . . . There were in addition manifestations of overactivity at the lowest levels of the brain-stem as judged by the occurrence of opisthotonos and attitudes of decerebrate rigidity. . . . ."

All this is supportive of our interpretation as outlined above.

Conclusions.

The neurological manifestations of insulin (hypoglycemic) shock indicate that the site of greatest disturbance in the central nervous system is the region of the basal ganglia, central gray, and brain-stem. Hardly any symptoms are referable to the pallium. Those which ordinarily would indicate cortical involvement (amnesia, disturbances of speech) seem referable to the disturbance of consciousness which prevents proper apperception.



GRAPHICALLY EPITOMATIZED SYMPTOMATOLOGY.

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ANALOGIES AND OPPOSITES IN SCHIZOPHRENIA AND EPILEPSY.

Electroencephalographic and Clinical Studies.*

By HERBERT H. JASPER, D. ès Sc., CHARLES P. FITZPATRICK, M. D., and PHILIP SOLOMON, M. D.

Two lines of evidence from clinical studies of schizophrenia and epilepsy have suggested that there might be some kind of antagonism between the two disorders. One is the statistical finding that the combination of epilepsy and schizophrenia occurs less often than one might expect by chance, and the other is that some schizophrenic patients appear to be benefited by having convulsions.

Meduna,[1] in a paper published in 1935, states: "an antagonism exists between these two diseases which is so striking that it cannot be due only to chance." He cites Müller as reporting two cases of "catatonic conditions showing healing after the spontaneous appearance of an epileptic convulsion." Meduna, basing his therapeutic theory on this evidence, invented the metrazol convulsion treatment of schizophrenia. Other references in the literature which may be favorably construed as leading to this conclusion include a study by L. V. Angyval and K. Gyarfas,[2] and a genetic study by V. D. Heydt [3] in which three generations of epileptic parentage, comprising 31 individuals, were reviewed. In this study only 12 were normal; the others showed a variety of mental abnormalities but no schizophrenia.

A. Glauss,[4] in a paper discussing the combinations of schizophrenia and epilepsy, says: "Real combinations of schizophrenia and epilepsy occur less often than one would expect. However, unquestionably they do occur." In case No. 7 of his series the patient was at first schizophrenic, later a combination of schizo-

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Research conducted with the aid of a grant from the Rockefeller Foundation. The helpful cooperation of Dr. Arthur Ruggles of Butler Hospital and of Dr. Seth Howes and Dr. Harold Williams of the Rhode Island State Hospital is gratefully acknowledged.

phrenia and epilepsy. He neglects to give the outcome mentally, but the patient died with congestive heart failure—presumably unimproved.

Müller [5] quotes Kraepelin as stating that 18 per cent of his schizophrenics had epileptic fits, but Kraepelin defines his epilepsy as dizziness. Müller, in his paper, cites two cases diagnosed catatonic type who greatly improved following an epileptiform seizure. From his clinical description of the cases one might, in the light of present conceptions, think of both these cases falling in the subclinical convulsive group.

Rodenberg [6] cites a case who developed seizures at 15 years preceded by autistic thinking. He was observed at the age of 27 years, apparently in a catatonic state, in November, 1926. January 5 of the following year he had two epileptic seizures and began to improve. January 12 he had two more seizures and was discharged February 17 clear.

Krapf,[7] in an exhaustive review of the literature, concludes: (1) It is not proved that there are combinations of "genuine epilepsy" and "genuine schizophrenia." (2) Epileptiform seizures as symptoms of schizophrenia are rare occurrences. (3) Combinations are theoretically possible but practically occur very seldom.

Giese,[8] in a study of 347 schizophrenics, reached the following conclusions: "Epilepsy must be considered a symptom of schizophrenia except when it can be attributable to exogenous causes; *e. g.*, trauma. In the majority of cases the epilepsy occurred in catatonics, but it may appear in any type."

Notkin [9] has observed epileptic manifestations of the major and minor types in five schizophrenic patients. He maintains, with others, that it is possible to differentiate clearly the schizophrenic from the epileptic psychoses even though the epileptic with a schizoid personality may present paranoid delusional states which simulate the pure schizoid psychosis. The differentiation, he maintains between a deteriorated epileptic and a deteriorated schizophrenic is quite clear since in the one case we have a passive vegetative being, while in the other there is much more active negativism. There is no indication, however, in his studies of a genuine antagonism between epilepsy and schizophrenia.

In the clinical experience of one of us, one or more epileptiform seizures have occurred in the course of three schizophrenic reac-

tion types without any amelioration of symptoms or any other discernible effect on the course of the psychosis.

From the above it would seem that the issue of the antagonism between schizophrenia and epilepsy is confused. It would seem evident that the terms "schizophrenia" and "convulsive disorder" should again be reviewed in the light of objective measurements which have been added to our armamentarium by new techniques. In the present study clinical and electroencephalographic investigations of schizophrenic, epileptic, and normal individuals have been made in the attempt to shed some light on a possible antagonism or perhaps a similarity between schizophrenic and convulsive disorders. The attempt has been made also to find some consistent type of brain potential pattern in the electroencephalograms from the group of patients clinically designated as schizophrenic.

Case Material.

Eighty-two schizophrenic patients used in this study were selected from a much larger group at the Howard State Mental Hospital and at the Butler Hospital. Selection was based on the judgment of five competent psychiatrists that the patient presented a clear picture of the classical schizophrenic process. Cases questioned by any one psychiatrist were not included in the final statistical data although some of them were examined for special study. The patients ranged in age from 12 to 68 years at the time of examination. The age of onset was below 35 years in over 90 per cent and below 25 years in 50 per cent of the cases. They were distributed according to clinical classification as follows: Catatonia, 28; hebephrenia, 22; paranoia, 18; and simple, 8.

The 51 epileptic patients used for comparison with the schizophrenic material were selected from a larger group as those having clinical grand mal or petit mal attacks and those upon whom we had adequate electroencephalographic records from all head regions during periods completely free from overt clinical manifestations of a seizure. The age range (12 to 50) was comparable to that of the schizophrenic group.

Sixty normal subjects of age range similar to that of the other two groups were used as controls. They were members of hospital staffs and students from Brown University. All subjects with

questionable neurological findings were excluded, although this could not assure that there were not members of the group on the extreme end of the normal range.

Technique.

A standard electroencephalographic technique was employed for all examinations forming the basis for the present report. The measured placements of electrodes for obtaining both bipolar and monopolar records of the electrical activity from the right and left frontal, central, and occipital regions of the head have been described in detail elsewhere (Jasper and Andrews [10]). Four non-interfering amplifiers and Westinghouse oscillograph systems were used to obtain simultaneous photographic records from four different head regions. In a few of the later records an inkwriting oscillograph was used, but in all cases the electroencephalograms were controlled with the photographic method of recording. Simultaneous recording from different head regions made possible the observation of electrical signs of disorganization or disassociation between brain regions and the comparison of the degree of integration found in the normal as opposed to the two pathological groups.

The abbreviations used for the different head regions are as follows: Frontal, FRONT.; central, CENT.; parietal, PAR.; occipital, OCC. The letters L. or R. preceding the regions indicates the left or right side. The letters B. and M. following the head region indicates bipolar and monopolar leads respectively.

During the recording care was taken to obtain maximum relaxation, to avoid drowsiness or sleep, and to keep the subject's eyes closed. All departures from these conditions, as well as all movements made by the patient, were signalled directly onto the photographic record by a trained observer seated beside the subject. This was found to be extremely important since many movement artifacts could easily be confused with abnormal brain activity. For example, very slight movements of the head on the pillow associated with breathing or restlessness would occasionally cause deflections of the oscillogram which appeared very much like some of the slow baseline wanderings described in schizophrenic patients (Hoagland *et al.*[11]). Eye movements are also capable of producing misleading potentials in the records obtained from the frontal head regions (Jasper and Hawke [12]).

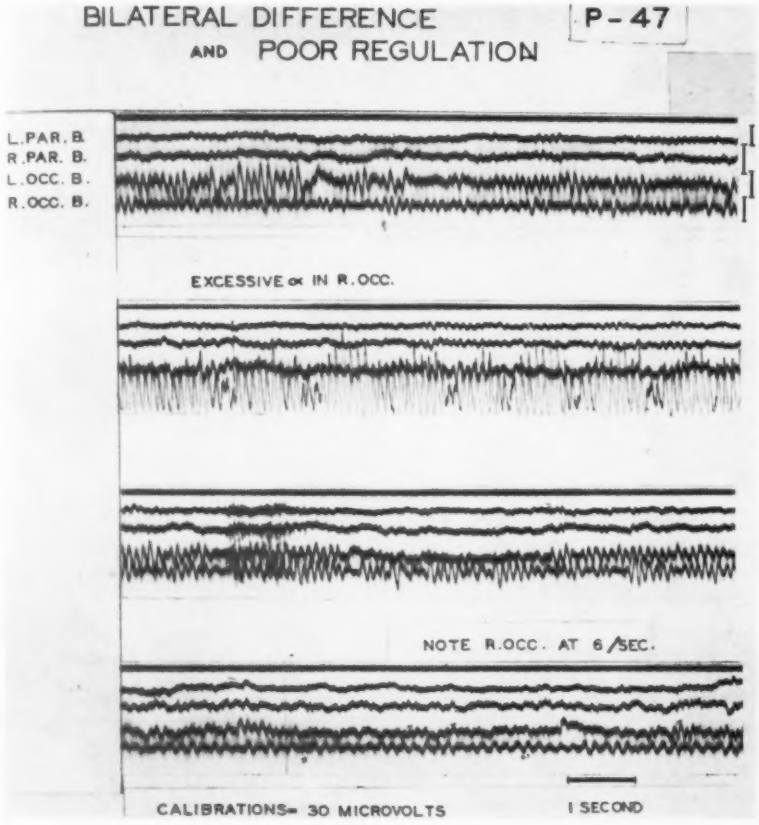

FIG. 1.—Electroencephalogram of patient P-47, a white male, age 29. The patient is a deteriorated catatonic showing marked muscular rigidity and hypertonia. This is the most marked case of bilateral dissociation in the brain waves from homologous areas. (See text for description.)

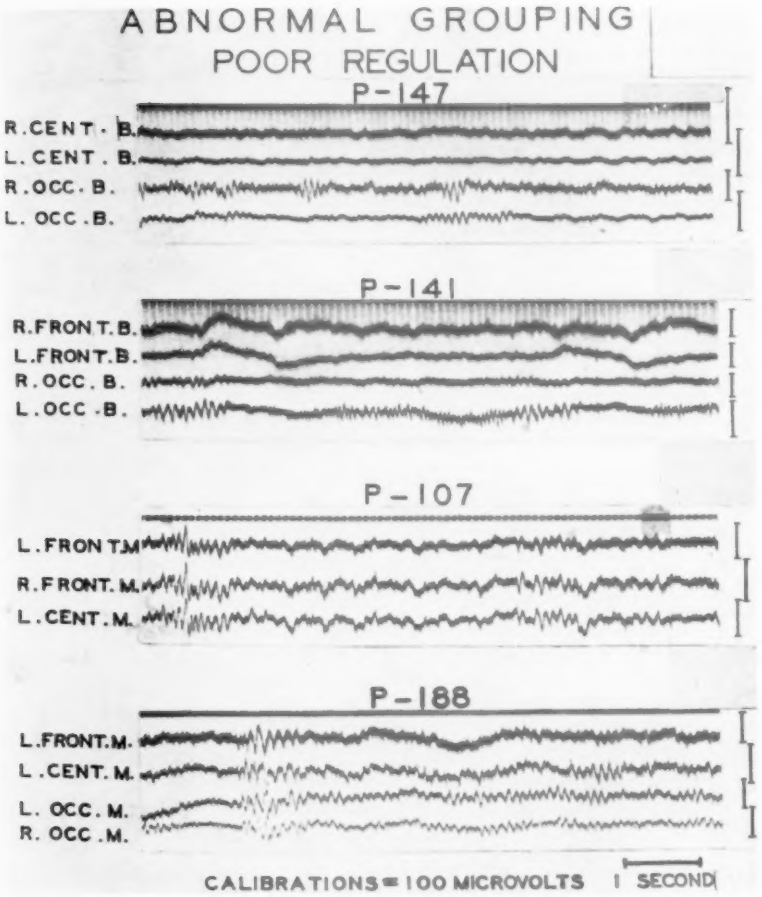

FIG. 2.—Sample electroencephalograms of the following four patients:

P-147—white male, age 42. This patient's history shows a definite head injury with unconsciousness three months previous to onset of psychosis at age of 32 years. He is now apathetic and occasionally becomes over-active for short periods.

P-141—white female, age 31. The onset of the psychosis occurred at 20 years. The deterioration has been progressive. Patient is now withdrawn, apathetic and hallucinative.

P-107—white male, age 29. The patient is a deteriorated catatonic showing marked muscular rigidity and hypertonia.

P-188—white female, age 38. Onset of psychosis at 19 years. The patient has had several episodic mental disturbances of the catatonic type. There is a history of fainting spells.

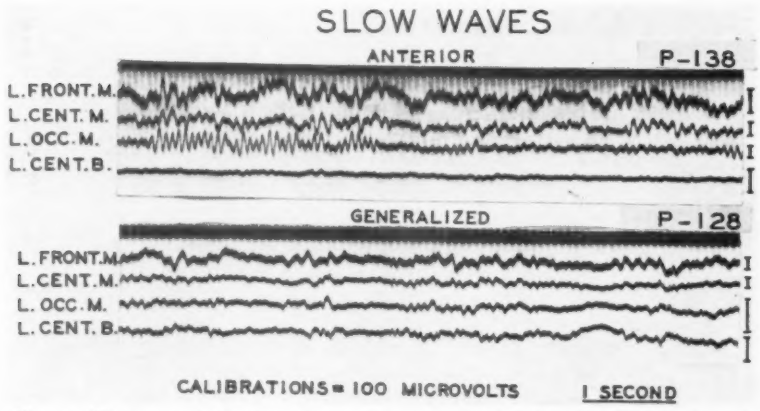

FIG. 3.—Electroencephalograms of two patients illustrating different types of irregular slow wave activity.

P-128—white male, age 33. History extends back to childhood when he sustained a severe head injury. Subsequent history is suggestive of an epileptiform personality disorder. At present the patient is paranoid.

P-138—white female, age 17. Onset of illness at 13 years. Present clinical status alternates between over-activity and apathy. There is little contact with reality.

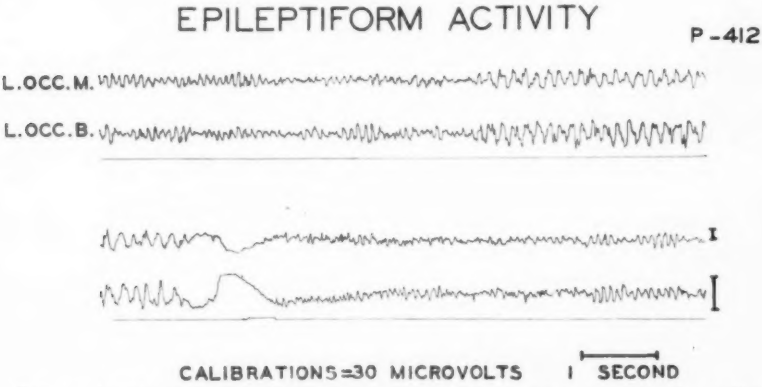

FIG. 4.—Sample electroencephalogram of a burst of slow waves in patient with a schizophrenic reaction to a convulsive disorder. (See text for case history which includes description of this record.)

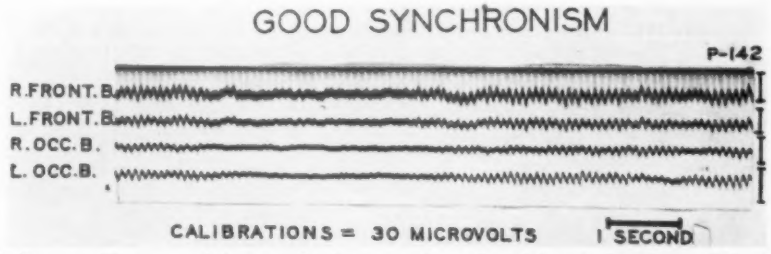

FIG. 5.—Electroencephalogram showing normal regular alpha rhythm from all head regions. This patient, P-142, was a colored male, age 33, with onset of illness at 32 years. He is a paranoid with good contact and affect but with many delusions and a few vague hallucinations.

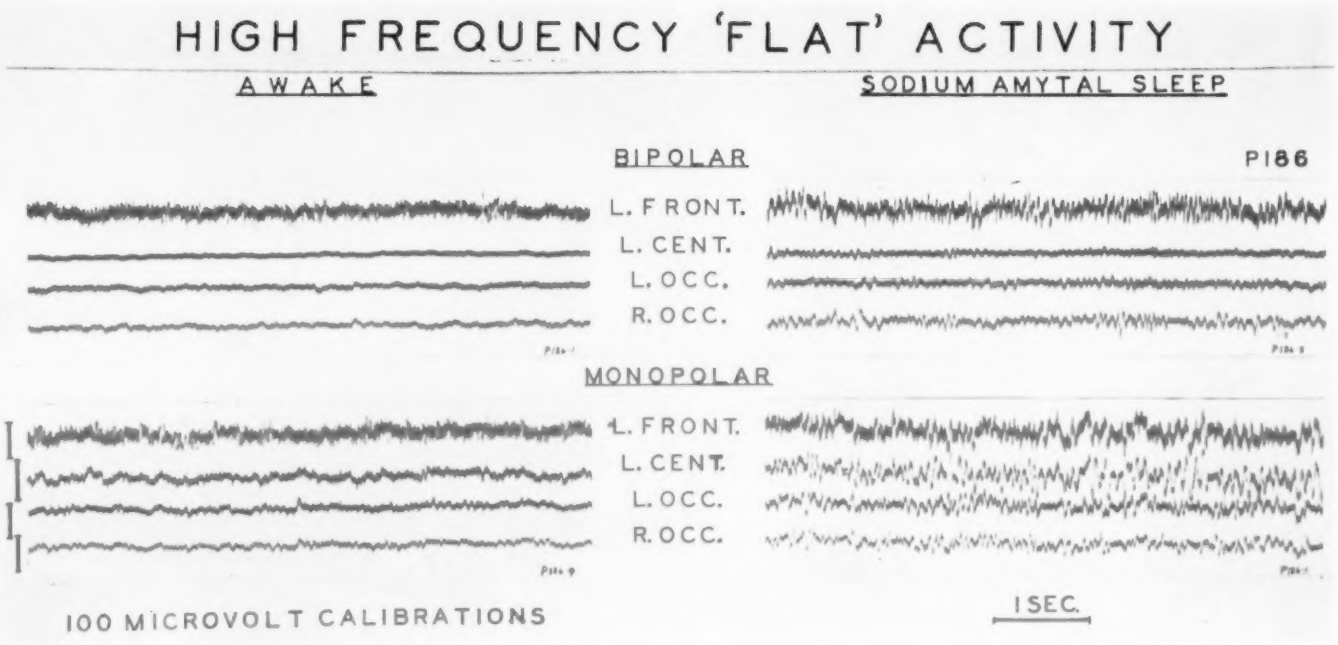

FIG. 6.—A typical electroencephalogram found in a group of patients exemplified by this case, P-186, a white female, age 23. Onset of illness was at 20 years. She is preoccupied, hallucinatory, and stuporous.

SLOW WAVES PLUS ALPHA WAVES

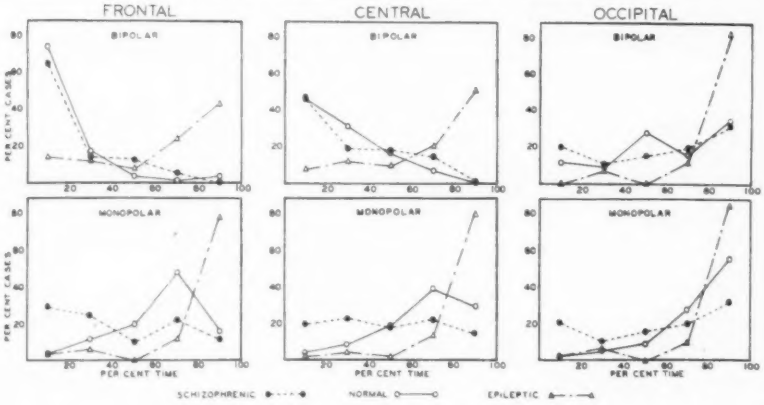

FIG. 7.

ALPHA WAVES

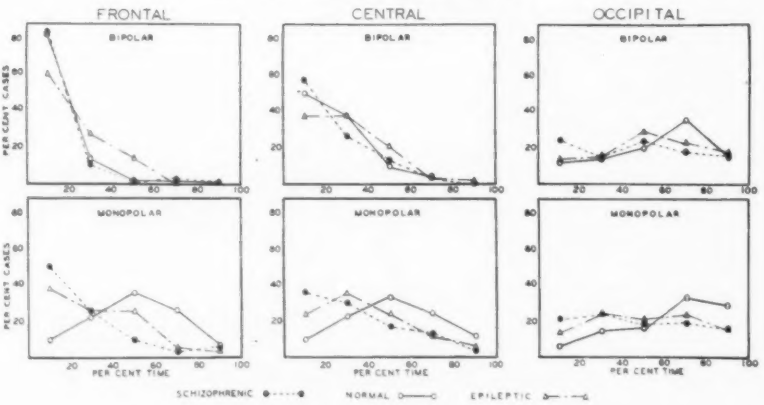

FIG. 8.

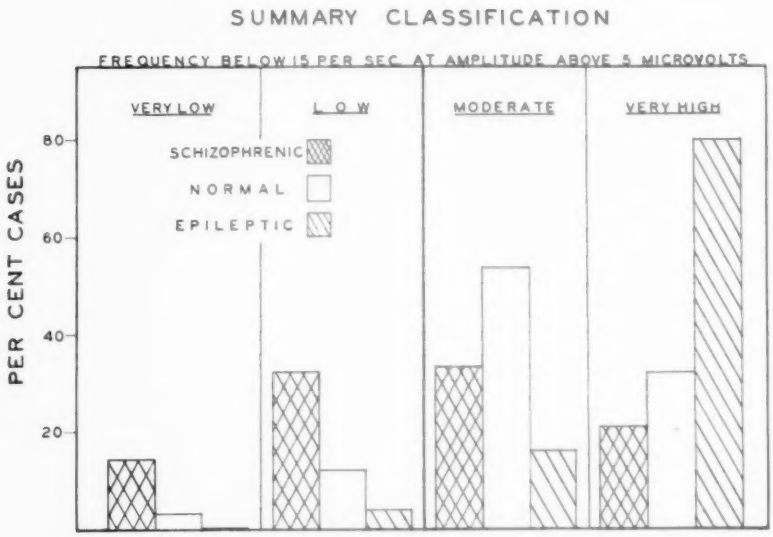
SUMMARY CLASSIFICATION
FREQUENCY BELOW IS PER SEC. AT AMPLITUDE ABOVE 5 MICROVOLTS
VERY LOW
LOW
MODERATE
VERY HIGH
SCHIZOPHRENIC
NORMAL
EPILEPTIC
PER CENT CASES
80
60
40
20

FIG. 9.

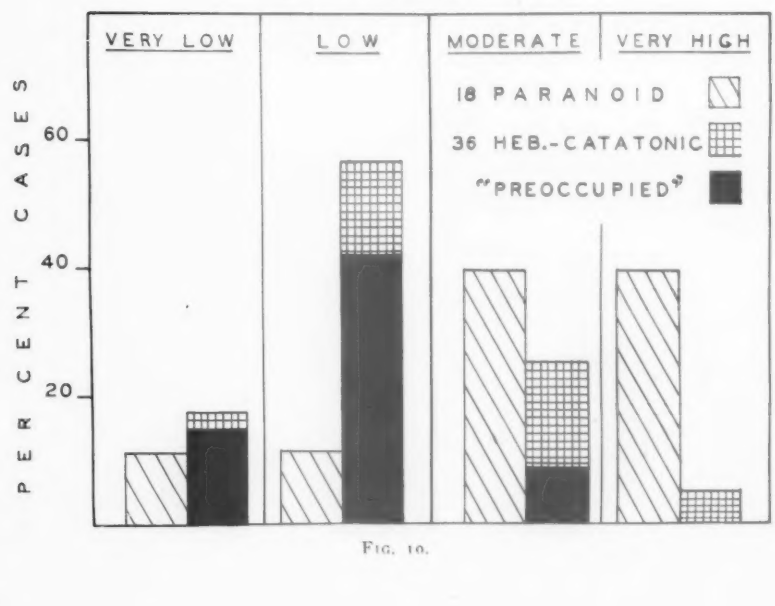
HEBEPHRENIC-CATATONIC
VS. PARANOID
VERY LOW
LOW
MODERATE
VERY HIGH
18 PARANOID
36 HEB.-CATATONIC
"PREOCCUPIED"
PER CENT CASES
60
40
20

FIG. 10.

In the quantitative analysis of the records all activity below 5 microvolts in magnitude was disregarded, even though the noise level of the recording system was not over 1 or 2 microvolts. This limit was set for purposes of standardization since, in some cases, muscle potential disturbances made the estimation of brain potentials below 5 microvolts rather questionable. A high-frequency, cut-off filter was used in most of the records to minimize muscle potential disturbances. It caused practically no attenuation of frequencies below 120 per second with a reduction of about one-half at 400 cycles per second.

Qualitative Results.

We could detect no single specific form of activity in the electroencephalograms from patients diagnosed schizophrenic which would distinguish them, as a group, from those classified as epileptic or as normal. On the other hand, a wide variety of anomalies were found to a more extreme degree and in a greater number of the schizophrenic patients than in the normal subjects. These anomalies are described under the following headings:

Bilateral differences.

Marked differences in amplitude, frequency, amount, or form of the electrical activity from homologous head regions were observed in 25 per cent of the schizophrenic patients. Eight per cent of the normal cases showed a moderate degree of such dissimilarity, in no case approaching that found in some of the records of the schizophrenic patients. One of the more extreme cases (P-47) is illustrated Fig. 1.

The marked difference between the activity of the right and left occipital regions apparent in the first sample became more striking when, after a startle reaction to a loud sound, the right occipital alpha increased in amplitude from 10 to 15 microvolts to as high as 80 to 100 microvolts, while the activity from the left occiput was depressed (second sample). The heightened activity on one side continued for over two minutes before gradually returning to a more normal level as shown in the third sample. Then, as though fatigued from this over-activity, the right occiput slowed down to a regular rhythm of 6 per second, the left occiput showing simultaneously the normal 10 per second rhythm (fourth sample).

ABNORMAL GROUPING AND POOR REGULATION.

The alpha rhythm in normal subjects usually presents a rather smooth, evenly regulated, modulation in amplitude (Jasper,[13] p. 432). The records from some of the schizophrenic patients were characterized by the sudden appearance of short bursts of two to six waves, often of alpha frequency, at intervals of from 2 to 20 or 30 seconds; the rest of the record being made up of very low amplitude miscellaneous higher frequency potentials (a "flat" or "fuzzy" line as in Fig. 2, P-147, P-141) or random slow waves (Fig. 2, P-107). Examples of this type of brain potential pattern with variations from four different patients are shown in Fig. 2.*

SLOW WAVES AND EPILEPTIFORM ACTIVITY.

Slow waves, from 1 to 6 per second, or at random intervals, were found to occupy more than 15 per cent of the records from one or more head regions (usually anterior) in 92 per cent of the epileptic patients, and in 48 per cent of the schizophrenic patients as compared to 33 per cent of the normal subjects. These waves (due to their paroxysmal appearance as characteristic of the epileptic group) were suggestive of epileptiform activity in 21 per cent of the schizophrenic group and in only 6 per cent of the normal subjects. Examples of this type of activity in two patients are shown in Fig. 3. Another more striking case of this type of "schizophrenic" reaction is presented in more detail.

CASE REPORT—*P-412.*—N. D., age 25, a single, white woman who was admitted to the hospital as a voluntary patient. The patient sought hospital treatment because, during the past three years, she had been becoming more seclusive and showing a progressive retreat. One of the patient's chief complaints was that she was worried about her mind because she could not concentrate. She had been seen by many physicians for psychotherapy and neurological examinations. The diagnosis was schizophrenia, paranoid type.

The family history revealed that both grandfathers were alcoholic but were active, successful men. The father is a quiet, retiring man who has become more withdrawn after suffering financial reverses. The mother died at 38 of hyperthyroidism. The patient has one brother 38 years old who is a successful business man.

* It is interesting to note that Chweitzer [14, 15] has recently shown that such records as these can be reproduced in normal individuals with Mescalin intoxication.

Further inquiry into the patient's personal history revealed that she had felt her mother's loss a great deal and during adolescence had made a poor social adjustment. She attended a girl's private school, made no friends, and just managed to graduate, being a very mediocre student. She entered a women's college at 21 but remained only three months and then left. The succeeding four years were spent in travelling. The patient, however, gained little from her trips and would often spend her time in foreign ports lying in her bunk and not going ashore. The last few months preceding admission were spent in retreat in a New York apartment which she very seldom left. For the past few years the patient has shown a paranoid trend which has been gradually strengthening.

It was also elicited in taking the history that the patient complained of myoclonic jerks occurring in the morning. These muscular twitches would sometimes cause her to spill her coffee. She also complained of several shivering attacks occurring at night. These shivering attacks were uncontrollable and she would partly lose consciousness. The attacks were sometimes provoked by alcoholic indulgence the previous evening.

Physical examination was negative except for general muscular hypertonicity, sluggish reflexes, and a Vincent's infection of the gums. Electroencephalographic examination revealed slow brain rhythms of 6 per second, each burst lasting from 1 to 10 seconds and occurring at intervals of from 15 seconds to 2 minutes. A sample record is given in Fig. 4. The sequence of events shown in this figure is, first, a period of normal alpha rhythm followed by a burst of slow waves of greater amplitude, these in turn followed by a depression of activity and high frequency waves (characteristic of the reaction produced by startle stimuli). These high frequency waves were gradually replaced by the normal alpha rhythm (10 per second).

Under treatment over a period of six weeks it was possible, by adjusting the daily dosage of luminal and bromide plus high fat diet and water restriction, to produce a return of the brain potentials to normal. Coincidentally the clinical picture improved markedly. The girl made a very much better social adjustment, her interest in life and hospital recreations increased, and she is now living outside the hospital making a very satisfactory adjustment.

It is only fair to state that in addition to the medication she also received regular psychotherapeutic interviews. The psycho-therapist reports that he began to notice a marked improvement and change of attitude coincidentally with the return to normal of the brain rhythms.

This case is presented as one which was diagnosed schizophrenia because of a definitely schizophrenic reaction to what was later shown both by certain aspects of the clinical picture and by the electroencephalogram to be fundamentally a convulsive disorder.

GOOD REGULATION AND SYNCHRONY.

In marked contrast to the above records showing various signs of disintegrated brain function, a few schizophrenic patients gave

evidence of an extreme degree of synchronization and regularity in the brain potential activity not only of bilaterally homologous areas but also of such widely separated regions as the frontal and occipital poles, even when bipolar recording assured the local origin of the potentials observed. An illustration of a case, P-142, which showed nothing but a very regular high amplitude normal alpha rhythm from all head regions with even synchronous depression of the rhythm is shown in Fig. 5. Such a high degree of generalized synchrony was found in about 10 per cent of our schizophrenic patients, and in only 2 to 3 per cent of the normal subjects.

CONTINUOUS HIGH FREQUENCY AND "FLAT" RECORDS.

Another group of the schizophrenic patients gave very few potential waves below 15 per second.* In some of these patients the activity of the frontal regions was characterized by almost continuous high frequency potentials (up to 100 per second) at amplitudes of from 50 to 100 microvolts when recorded with monopolar leads, the paired leads usually showing a relatively "flat" line. The high frequency potentials were at first thought to be due entirely to muscle artifacts since almost the same type of record can be produced by sustained tension of the head muscles. However, no unusual tension of the muscles could be detected upon palpation and the high frequency activity may be of brain origin. Since muscle artifacts had not been completely ruled out, the records were considered only as presenting an absence of frequencies below 15 per second.

In normal individuals the "flat" records are associated with an intense startle reaction or acute states of apprehension or anxiety (Jasper [16]). Records directly from the cortex in animals have shown this type of activity in response to pain or startle stimuli or to a sustained organic tension (the "cat-box," Rheinberger and Jasper [17]). The sustained high frequency usually low amplitude activity recorded from all head regions in a group of schizophrenic patients strongly resembles the picture obtained from direct cortical recording in the unanesthetized cat during an intense startle or panic reaction.

* The quantitative treatment of this aspect of the records will be given later.

An example of the "flat" type of record with the changes produced by the intravenous administration of sodium amytal is shown in Fig. 6.

It should be apparent from the above results that the schizophrenic group as a whole shows no characteristic electroencephalogram. A further attempt to reveal a general tendency in this group will be made through the quantitative study of certain aspects of the records.

Quantitative Results.

Certain aspects of the electroencephalograms are susceptible to quantitative treatment. One of the most common is the "alpha index" which is the per cent of time occupied by alpha waves in a given sample of record (Davis and Davis).[18] Alpha waves have been defined in this study as those waves which appear with regular periods at frequencies from 8 to 15 per second. Waves which appear either regularly or irregularly at frequencies below 7.5 per second are considered as "slow waves."

In addition to the per cent time alpha activity we have calculated also the per cent time alpha plus slow waves since in many of the records there seemed to be, in addition to the regular alpha waves, many slower potentials which represented a form of activity in need of quantitative consideration as opposed to the type of record which showed practically no potential disturbances below 15 per second.

The first gross measure of per cent time alpha plus slow waves is merely an indication of the amount of record occupied with potential deflections below 15 per second. The reciprocal of this measure is the per cent of record composed of beta waves or a flat line. As part of this gross measure there is the per cent time alpha, which indicates the amount of total activity which is of sufficient regularity and of the proper frequency to be called alpha waves. The difference between the per cent time alpha and the per cent time alpha plus slow waves should give a rough indication of the amount of slow wave activity present with no regular alpha waves.*

* This indication of the per cent time slow waves is related to the "delta index," as introduced by Hoagland *et al.*,[11] but it is not the same measure. The "delta index" includes the amplitude of slow waves and also slow deflections of the base line upon which the alpha waves are superimposed. Since base line wanderings are difficult to measure accurately, and are easily intro-

The reason for making such a separation in the type of activity is due to the fact that in the normal brain, the presence of the alpha rhythm is related to a state of moderate freedom from excitation, either exogenous or endogenous. Slower waves are usually related to a lowered excitatory level, *e. g.*, sleep (Loomis, Harvey, and Hobart,[19] and Davis *et al.*[20]), or to toxic, metabolic, or circulatory changes which cause a depression of function (Jasper,[13] pp. 440 and 450). Although we are far from being able to give an adequate interpretation, electroencephalograms composed, for the most part, of frequencies above 15 per second, usually of very low amplitude potentials, may be related to heightened excitatory conditions which do not permit the organization of individual units into the synchronized beats giving rise to the regular alpha waves or to the large amplitude slower waves.

The frequency distributions showing the relative per cent of schizophrenic, normal, and epileptic cases which fall along the scale of per cent time alpha plus slow waves from 0 to 100 are shown in Fig. 7. The three head regions, frontal, central, and occipital, from which records were taken, are given separately. Also, the bipolar leads, representing more localized surface cortical activity, are given separately since there are large differences between the records obtained with the bipolar and monopolar methods of recording (Jasper and Hawke[12] and Rubin[21].)

The most striking feature of these distribution curves is the fact that a much greater proportion of the epileptic patients show a high percentage of alpha plus slow wave activity as compared to both the normal and schizophrenic groups. This holds true with both bipolar and monopolar leads to all head regions. The distribution curves of records from bipolar leads to frontal, central, and occipital regions show no significant differences between the schizophrenic and normal groups.

The monopolar leads, however, serve to give a better differentiation between the normal and schizophrenic groups as well as the epileptic group. In all three head regions the schizophrenic group is distributed rather evenly from 0 to 100 on the per cent time scale while the majority of the normal subjects are found above 50 per

duced by a number of artifacts the "delta index" has not been used in the present study. Also, the "delta index" is not comparable to the alpha index as a per cent time measure.

cent with peaks at about 70 per cent for the frontal and central regions and at about 90 per cent for the occipital region. In all curves the schizophrenic group shows more cases in the 0 to 20 per cent class and fewer cases in the 80 to 100 per cent class than either of the other two groups. The normal group falls clearly between the schizophrenic and epileptic groups.

When plots are made of the regular alpha waves alone, eliminating the slow and irregular waves from the per cent time measurements, we obtain a somewhat different result, as shown in Fig. 8, Here again the bipolar records yield a very different result from the monopolar records. In the frontal region we find that most of the cases show very little alpha activity from the bipolar leads while the majority of the normal group have above 50 per cent alpha from the monopolar leads. The schizophrenic and epileptic groups both tend to show less alpha than do the normal subjects considering the monopolar records from all head regions and the bipolar records from the occipital region. This may be misleading until it is considered in the light of the previous curves based upon alpha plus slow waves. The absence of alpha waves in most of the schizophrenic patients means the presence of a large amount of "flat" higher frequency activity while the same low per cent alpha for the epileptics usually indicated a large amount of slow wave activity. The same general tendencies in numerical form are presented in Table 1.*

In order to clarify the most important tendencies all cases were grouped into two groups, the "low" and the "high" group, on the basis of the amount of alpha plus slow wave activity present from all head regions. These two groups were then subdivided into those showing an extreme absence of this type of activity ("very low") and at the other extreme, those showing an extremely large amount of this type of activity ("very high"). A column graph of the per cent of each of the three groups of cases falling in these classes is shown in Plate 14.

* The probable error of the mean is presented in each case to facilitate the calculation of the statistical significance of the differences observed. This must be interpreted with caution, however, since the distributions are far from being normal Gaussian curves. Taking 4.P.E. as a significant difference, the above differences in means will all assume at least this degree of significance if they are equal to or greater than an algebraic difference of 7 per cent.

Although these mean tendencies show some significant group differences the distribution curves presented above served to indicate a great deal of overlapping in the three groups. This is as important from a clinical point of view as are the central tendencies, especially in view of the marked differences found in the types of record obtained from schizophrenic patients. The schizophrenic group especially appears to be very heterogeneous so that any generalizations which would be of clinical significance are not warranted from our data. We shall attempt to relate some of these variations in the electroencephalogram to clinical symptoms.

TABLE 1.

MEAN PER CENT TIME ALPHA AND SLOW WAVES.

	Schizophrenic.				Normal.				Epileptic.			
	Bipolar.		Monopolar.		Bipolar.		Monopolar.		Bipolar.		Monopolar.	
	M	P.E.	M	P.E.	M	P.E.	M	P.E.	M	P.E.	M	P.E.
Frontal												
α and slow.	20	0.9	40	0.8	16	1.1	62	0.7	63	0.7	81	0.7
α only	11	1.1	27	0.9	11	1.1	49	0.7	20	0.9	31	0.8
slow	9		13		5		13		43		50	
Central												
α and slow.	29	0.9	45	0.7	25	0.9	66	0.7	69	0.7	84	0.7
α only	20	0.9	32	0.8	14	1.4	52	0.7	29	0.8	37	0.8
slow	9		13		11		14		40		47	
Occipital												
α and slow.	57	0.7	55	0.7	59	0.8	75	0.7	84	0.7	85	0.7
α only	47	0.8	45	0.8	57	0.7	62	0.7	53	0.7	50	0.7
slow	10		10		2		13		31		35	

RELATIONSHIPS WITH CLINICAL SYMPTOMS.

No clear relationship could be shown between the electroencephalographic findings and the diagnostic groupings of hebephrenic, catatonic, and simple as determined by the hospital staffs. The paranoid group tended to show more cases with a large amount of the slower high amplitude waves and fewer cases with the low amplitude "flat" records than did the other patients.

At the time of the electroencephalographic examination the patient's degree of contact with the environment was noted. This

report, together with the case history, hospital course and physician's opinion, was used to classify the patients into four groups according to their degree of contact. There was a definite tendency for those patients who seemed most out of contact with the environment, usually showing signs of intense preoccupation, to give the "flat" type of brain potential picture with very few waves below 15 per second. Those patients in good contact tended to have a relatively larger amount of the high amplitude slower frequencies. A contingency correlation of 0.50 (maximum possible for perfect relationship is 0.86) was obtained with the four classifications of electroencephalograms from the large to the small amount of slower activity.

A graphic presentation of this relationship is given in Fig. 10. It is evident that the paranoid group falls for the most part in the moderate or very high classifications on the basis of the amount of activity below 15 per second. The hebephrenic-catatonic group tends toward the low end of this scale, with those "preoccupied" or out of contact being almost entirely within that group whose records contained very little activity of alpha wave frequency or below.

Of the 82 cases diagnosed clinically as schizophrenia by the hospital staffs and showing clinical symptoms of schizophrenia, 14 (17 per cent) gave clear evidence, from the history, of cerebral lesion, head injury, mental defect, or one or more actual epileptic attacks. An additional ten cases had histories or clinical signs suggesting cerebral lesions or epileptic disturbances. In the total group of 24 cases with a history indicative of cerebral lesion, only two cases were free from electroencephalographic signs of abnormal brain activity. Of the twelve cases with known or probable epileptic disturbances, eleven showed abnormalities in the electroencephalograms; nine had slow waves and five had slow waves of the epileptiform type. Seven additional cases gave brain potentials of the epileptiform type which were unexpected from the available clinical histories. A total of 23 per cent of cases diagnosed by hospital staffs as schizophrenia showed clinical or electroencephalographic evidence of epileptiform disturbances.

Discussion.

There are two main difficulties in the systematic interpretation of the results of the present study. One is that we are apparently in need of a reorganization of our thinking on the subject of schizophrenia both from a diagnostic and a pathological point of view. The second is that our knowledge of interpretative principles regarding the basic physiological processes underlying the electroencephalogram has not advanced far enough as yet to permit one to go much beyond a simple description of differences in brain potential patterns with a few possible correlations of physiological states with certain of these patterns.

Some light may be shed on this problem by the viewpoint recently expressed by Singer,[22] namely a distinction between the "form" of the reaction, which is a function of the whole personality, and the specific pathological process to which the individual is reacting. The electroencephalographic record may be more related to specific pathological processes largely cortical, rather than to the mechanisms responsible for the schizophrenic personality reaction.

The wide variety of abnormal and normal electroencephalographic records found in patients diagnosed schizophrenia probably means, as Singer suggests, that present diagnosis is based upon "form" of the reaction to a variety of pathological conditions or to situational conditions (he considers the latter group as better classified with the psychoneuroses rather than with the psychoses). It is hoped that, with the progress of our knowledge of the basic mechanisms of cerebral function underlying the activity revealed by the electroencephalogram, this new technique may serve as an important guide to the more fundamental pathologic mechanisms underlying the heterogenous group of disorders now classified as schizophrenia.*

* It is of interest to be reminded of Bleuler's original point of view which is given experimental support in this study. He states that, "Even though we cannot as yet formulate a natural division within the disease, nevertheless schizophrenia does not appear to us as a disease in the narrower sense but as a disease group, about analogous with the group of the organic dementias, which are divided into paresis, senile forms, etc. One should, therefore, really speak of schizophrenias in the plural. . . . . It is characterized by a specific kind of alteration of thinking and feeling, and of the relations with the outer world that occur nowhere else."—A Textbook of Psychiatry, p. 373.

Summary and Conclusions.

1. The statistical treatment of the results of this study indicate that patients diagnosed as schizophrenic and epileptic tend to fall at opposite ends of a scale of classification based on the amount of brain potential activity of alpha frequency or below. Persons clinically considered normal tend to fall in the median range on the scale.

2. It cannot be said that there is any general antagonism between the epileptic and the schizophrenic conditions. Schizophrenic and epileptic reactions were found clinically combined and a significant number of schizophrenic patients showed electroencephalographic evidence of brain activity similar to that characteristic of the epileptic group.

3. Twenty three per cent of patients diagnosed as schizophrenic by hospital staffs showed either clinical or electroencephalographic evidence of epileptiform disturbances. Twelve of these patients showed clinical symptoms of epilepsy and six had definite clinical convulsions.

4. Fifteen per cent of our group of patients diagnosed as schizophrenic may well be suffering from mental disorders due to head injury, mental deficiency, or other organic defect of the brain.

5. The abnormalities found in the schizophrenic patients included extreme disassociation of the activity of homologous brain regions, poor regulation of the frequency and amplitude, and abnormal grouping of potentials, in addition to the random slow and epileptiform types of waves.

6. Individual schizophrenic patients show extremely wide differences in the characteristics of brain function detected by the electroencephalogram. Some give records which overlap considerably those found in normal individuals, others are in the direction of the type of activity found in epileptic patients, and others appear to be in the opposite direction.

7. Our work with the electroencephalogram suggests that the clinical entity schizophrenia is a highly individualized reaction to a number of different kinds of cerebral activity.

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THE PAUCITY OF ARTHRITIS AMONG PSYCHOTIC CASES.*

By DONALD GREGG, M. D., Wellesley, Mass.

During 25 years close association with psychotic cases, after a thorough preliminary training in general medicine, I have often been intrigued by the seeming discrepancies and differences that psychotic cases show in their relative immunity to certain infections and other somatic conditions.

In 1934 before this association, I presented a paper based on the morbidity rates of certain diseases drawn from a study of 600,000 deaths in the Massachusetts community and 26,000 deaths among psychotic cases in the Massachusetts State Hospitals. The data then presented gave evidence that angina pectoris and coronary sclerosis were given as the cause of death 14 times more often in the community than in the state hospitals, and gastric and duodenal ulcer three times more often.

In the present paper there will be presented a study of the morbidity rates of arthritis in the Massachusetts community and among psychotics in the Massachusetts State Hospitals.

Rheumatism or arthritis in Massachusetts according to the report of the late George H. Bigelow, Massachusetts Commissioner of Health, is the commonest cause of chronic illness. He states, "At any one time there are approximately 145,000 individuals in Massachusetts suffering from rheumatism." Of these 120,000 are over 40 years of age.

A similar common prevalence among psychotic cases does not coincide with my experience nor with the opinions of other hospital superintendents with whom I have consulted. In order to obtain more definite information, a questionnaire was sent out to hospital superintendents, and from the first eight state hospitals and from one United States Veterans' hospital in Massachusetts the reports gave four cases bedridden and 16 additional cases seriously handicapped by arthritis among over 15,000 cases in these

* Read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, Calif., June 6-10, 1938.

nine hospitals. Two of these 20 cases were under 40 years of age and eight of the remaining 18 had developed arthritis before hospital entrance. Whether this means that the arthritis antedated the psychosis is unknown.

This data is shown in Tables I and II.

TABLE I.

CHRONIC RHEUMATISM IN MASSACHUSETTS IN 1930.

AS REPORTED BY GEORGE H. BIGELOW, M. D.

Number of persons in Massachusetts over 40 years of age		1,500,000
Number of cases of rheumatism	145,000	
Number of cases of rheumatism over 40 years of age.	120,000	
Among these 120,000 cases:		
Completely disabled	5,040	
Partial physical disability	36,480	
Total	41,520	
Incidence of complete disability		1 in 298
Incidence of partial disability		1 in 41
Incidence of complete or partial disability		1 in 36

TABLE II.

ARTHRITIS AMONG PSYCHOTICS IN MASSACHUSETTS FROM EIGHT STATE HOSPITALS AND ONE U. S. VETERANS HOSPITAL.

Number of psychotic cases..	15,196	Number over 40 years of age.	10,993
Number bedridden by arthritis	4	Number over 40 years of age.	3
Number seriously handicapped by arthritis	16	Number over 40 years of age.	15
Total	20		18
Incidence of bedridden			1 in 3662
Incidence of seriously handicapped			1 in 733
Incidence of bedridden or seriously handicapped			1 in 610

Assuming that these tables are comparable: The incidence of disabling arthritis is 17 greater in the community than among psychotics in Massachusetts State hospitals.

Supporting evidence that there is a discrepancy of incidence of arthritis in the two groups is the following data:

1. Among 3000 autopsies in 30 years of psychotic cases the State Pathologist has noted no frank arthritic joints.

2. In 23 years from 5766 cases, the Robert B. Brigham Hospital, the largest clinic in Boston, has transferred one case to the Boston Psychopathic Hospital.

3. Dr. H. A. Nissen stated in the *N. E. Journal of Medicine,* March 16, 1936, that in a recent visit to a state hospital he had found no arthritics among 2200 patients, and in a group of 500 arthritics he had found only three cases with mental disease and these cases were of gonococcic origin.

4. Among 1962 cases at a state school for the feeble-minded no cases bedridden or seriously handicapped by arthritis were found. (Three hundred and fifty-nine of these cases were over 40 years of age.)

In interpreting this statistical material I am fully aware of certain factors. Psychotic cases in mental hospitals lead a relatively placid protected life. They are well and simply fed. They are relatively unexposed to infections. They have good dental care. They are often too "dumb" to make many complaints as to their physical symptoms. Granting these advantages or explanations, is the situation explainable on these grounds alone? Are the following factors: a placid protected environment, plenty of good food fully complimented by vitamins, relative freedom from infectious contacts, good dental care, and "dumbness" sufficient and satisfactory explanations?

May I suggest this thesis as an additional explanation? Man is endowed with an equipment and pattern of reaction that enables him to escape from or fight off noxious situations and forces. The details—increased blood pressure, increased heart rate, increased blood sugar, alertness, slowing of gastro-intestinal activities, etc., you are all familiar with. These reactions are beneficial and useful when they occupy the usual stimulus—reaction span of time. If this stimulus-reaction span of time is unduly prolonged, the result is injurious to the individual.

Man by the addition of imagination at one end of the span and memory at the other end has lengthened the period during which the muscles, voluntary and involuntary are tense, the blood pressure

raised, the gastro-intestinal tract slowed, the heart rate increased, etc. These normal reactions unduly prolonged may produce an increased ischæmia of the muscles furthering infection and resulting in pathological conditions such as hypertension, angina, gastric ulcer, spastic colitis, and chronic arthritis.

In childhood, among the feeble-minded and among psychotic patients, imagination and memory have not yet developed, do not develop fully or have retrograded, and among these groups certain diseases closely related to emotional stress and strain seemingly are statistically rare.

Such a thesis would explain why among psychotic patients without a prolonged stimulus-reaction span, because of impaired imagination and memory, there is little prolonged muscle tension or drag on the joints, little setting of the stage for prolonged ischæmia, mal-nutrition or infection of the joints and therefore seldom chronic arthritis.

DISCUSSION.

DR. KARL A. MENNINGER (Topeka, Kans.).—I have been reading Dr. Gregg's work along similar lines, and I had this paper marked as one of the most important ones at the convention. I would not have missed it for anything, because I think that this observation that he has made and statistically supported is one of great importance.

The reciprocal relationship between certain mental sicknesses, as we call them, and certain physical sicknesses Dr. Gregg has previously reported with reference to other diseases than arthritis. He has now collected this information about arthritis and put it in such a vivid way that it must make all of us very thoughtful.

His explanation of just why this occurs is certainly one that no one can dismiss as impossible, but I should say that he explains certain mechanical or structural aspects of the situation, as I understand it, rather than what I should regard as the dynamic explanation, which of course does not preclude the other.

The way I look at this is that what Dr. Gregg showed us was another aspect of the phenomenon that we are acquainted with in general medicine, that human beings for some reason or other usually do not suffer from a number of diseases at any one time. They usually are sick with one disease rather than several.

I remember that Dr. Richard Cabot used to teach us that if one were attempting to make several diagnoses in the case, probably all of them were wrong, for people don't have a lot of diseases at once, they usually have one syndrome. We see more and more evidence of this.

In another section they are discussing asthma, which presents a similar problem, namely, the curious fact that some asthmatics cease to have asthma when other diseases occur.

A member of my own family had asthma badly until he had an orthopedic injury. During the six months he had this injury he never had an attack of asthma. When that got well, he began to have asthma again.

Now this substitution of one clinical syndrome—psychiatric, clinical or whatever it is—for another, certainly does mean something.

Another piece of evidence that I think is interesting is that these studies in regard to problem children in schools show that children who have the worst behavior disorders, had the best health record, whereas those with the worst health record had the best behavior.

Now, this substitution of aggressiveness or self-destructiveness in one more than the other would appear to have some kind of substitutive value. That is why it seems to me possible to postulate that sometimes one type of self-desructive consequences—I am not now speaking of the purpose but of the consequence—one kind of disillusion or incapacitation of the personality, may be substituted for another. Therefore, those for whom the psychosis is a sufficiently satisfactory type of retreat from life do not need the structural type of self-destruction or emulation of their aggressive fantasies as the others.

I don't think we know yet what emotional factor is involved. We do know the physical fact. But at any rate the fact that one is incapacitated mentally and often is in good health otherwise, strikes me as of the utmost importance and I think we owe a debt of gratitude to Dr. Gregg for collecting this very important information about which we can speculate all we wish; but the fact which still remains is that we must explain these cases sooner or later.

Dr. Clarence O. Cheney (White Plains, N. Y.).—It occurs to me that Dr. Menninger is not entirely supported by the fact that more mentally sick patients in the hospital develop tuberculosis and pneumonia than people outside, so they do have physical diseases in addition to their mental diseases.

I would like to ask Dr. Gregg if he can tell us the types of mental disorders of the 18 cases that had arthritis, whether they were essentially organic types or not. It might not be significant, but there is some interest in the point.

Dr. Fred P. Currier (Grand Rapids, Mich.).—It has occurred to me that possibly it would be of embryological significance here, the nervous system being ectoderm and the bony system, as I remember it, being mesoderm. I wondered if Dr. Gregg had given that any particular thought.

Dr. Donald Gregg (closing).—I must apologize for bringing something so simple, in a way, as an explanation such as I have advanced, but I am inclined to think in somewhat simple terms.

I think the facts are as shown. As regards the statistics, there is something to be explained. What the explanation may be, I do not know. I only know what I have found.

My idea was this, and perhaps this may furnish an explanation. I had a friend in India a while ago, who after watching some of the Indian fakirs run across hot coals with bare feet, found that he could do the same thing if as he ran across he picked his feet up fast enough, with no pathological injury to his feet from stepping on the hot coals.

Now, that is my conception of the difference in the different types of cases, that the primitive type of reaction such as we have in children, an emotional stimulus, gives us a brief reaction. Then, as the individual develops, memory and inhibitions and all sorts of things come in, so that the reaction time between stimulation and reaction is prolonged.

I wish very much that Dr. Ziegler could carry on with his work on temperature to see whether there is a difference in the psychotic and normal cases in the time it takes them to develop a temperature, and whether the temperature is a very short-lived one or is prolonged, comparing the psychotic with the ordinary cases.

I cannot accept Dr. Menninger's idea of a psychosis being a purposeful solution of a difficulty, any more than I can think of a sailboat tipping over on purpose. When there is too much wind for the sail area or not enough ballast, a given boat in certain circumstances tips over, because the unstabilizing forces out balance the stabilizing forces.

Of course, we are all intrigued as human individuals more by the complex than the simple explanation, but now and then it is worthwhile to come down to the simplest possible explannation, and this introduction of the time element of the emotional reaction as being a factor that can predispose or condition the human individual to infection or deterioration is worth considering.

OPPORTUNITIES OF SOUTHERN PSYCHIATRY.

Presidential Address.*

By GEORGE P. SPRAGUE, M. D., Lexington, Ky.

This is the fourth annual meeting of the Southern Psychiatric Association—an association organized by our Secretary, Dr. Owensby, and to this day, almost wholly developed by him. As little as the rest of us have had to do with its formation however, we are proud of its growth and very hopeful and ambitious for its future. Thus far though, we have been too busy with necessary preliminaries and with our splendid programs to give much consideration to our opportunities and to our future. I want therefore to take a few minutes' time today to discuss the objects of our association as stated in Article II of our constitution. I might say in passing, that I have read the constitutions of all of the psychiatric associations in the United States of which I have knowledge, and that this section contains a more comprehensive statement of aims than does any other.

Article II states that "The object of this Association shall be: to further the study of all ethical subjects pertaining to the cause, treatment and prevention of mental disorders; to promote the interests, maintenance and the advancement of standards of private and public hospitals for mental disorders, of out-patient clinics, and of all other agencies concerned with the medical, social and legal aspects of these disorders; to further psychiatric education and research; to increase psychiatric knowledge in other branches of medicine and in other sciences; and to furnish the public with the proper concept of psychiatric disease." Having such aims as these should not discourage or frighten us; they are all worthy ones, and their development is vitally needed both by the Southern psychiatric specialist, and by the Southern public. Personally, I fully endorse them all as stated.

* Delivered at the fourth annual meeting of the Southern Psychiatric Association, Atlanta, Ga., October 10-11, 1938.

But they are too important, too far-reaching and they involve too much work which will eventually cost us too much money, and they will require too much sustained interest and enthusiasm on our parts to be adopted without a careful and serious consideration such as has hardly been given them previously. I therefore urge that our council consider these avowed objects anew and report their conclusions to the association before the close of the present meeting. In other words, while there is no adequate reason for us to treat lightly any part of our constitution, nor has anyone suggested that we do so, it would seem worth while to give to this description of our objects and our reasons for existence as an association such an additional endorsement that there can be no doubt as to what course we shall pursue.

Having adopted the South as our field, we should realize the size of this territory in which we are to carry on our program; it is the section of the country known as the Southern States—17 states and the District of Columbia—more than a third of the entire United States, an area of more than a million square miles and the home of 44,000,000 persons. It contains at least 1667 hospitals, psychiatric and general, having a capacity of 244,800 beds. It also has 27 medical colleges, each with a standard four year course leading to the degree of Doctor of Medicine, besides four others, which give instruction for only the first two years of a medical course. This Southeastern third of the nation is, in parts, a fallow field for psychiatric development, as well as one which is steadily improving and which is growing ever more rapidly. In considering our domain and its possibilities, it is well to remember that the South has every natural resource of the richer North, together with incomparable climatic advantages which should make it, ultimately, the wealthiest and most powerful section of the nation, and thus able to furnish the support needed for its scientific development. At present, however, its neuropsychiatric resources are inadequate as compared with some other sections of the country, and we have the opportunity to do more toward their development than has ever been done before.

If we are to grasp the opportunity to cover the entire South with our endeavor to advance the cause of psychiatry, we must also assume the responsibility and realize that, like all things in nature, we must either advance or retrogress when we have once begun.

It is inconceivable that we should be willing to stand still and to let this chance to help in the development of psychiatry in the South remain neglected. Therefore, if we are to proceed, let us do it energetically; let us organize our field and get into our membership every desirable psychiatrist in our 18 states, remembering that with our vast territory we will need a membership which will include every psychiatrist in the South who can meet our qualifications for membership, remembering too that accurately to represent the South, we must be a democracy, not an aristocracy, and that there is an amount of work awaiting us which will test all the energy and ability of our association.

Let us urge the 43 state hospitals of the South with men holding memberships in The American Psychiatric Association, and the others having no such affiliation, to join with us in an effort to elevate our standards of care and treatment by every means of which we are capable. Let us contact the private institutions having care of neuropsychiatric patients and do what we can to have the sanatoria differentiated from the nursing homes, and to have the latter set apart from the boarding houses for the insane, both by the profession and by the public. There is now, in the Middle-West, an association of 25 private sanatoria—The Central Neuropsychiatric Association—whose aim it is to erect a class A group of private sanatoria with high and rigid standards, and with provision that failure to observe the stated minimum requirements will automatically cancel the offender's membership. This is a step in the right direction, but it needs the support of the entire medical profession.

Let us show the medical colleges that we have a real and appreciative interest in the way in which they are increasing their hours of psychiatric instruction. Let us urge that no department of medical training can be taught thoroughly unless its psychiatric needs are included definitely. Let us point out that the gradually changing attitude of the medical college from the former one of ignoring psychiatry to the present one of steadily increasing the number of hours of psychiatric instruction required, is an evolution which must eventually lead to a realization that the teaching of both normal and morbid psychology to medical students should be elemental instead of merely secondary.

Various other measures which I have not mentioned but which are stated in that wonderful Article II, will occur to you, but from now on we shall need to carry forward two coincident efforts: first, an analysis of our field, which means the men, the institutions, the possible methods of support, the attitude of the profession and of the public; and second, an earnest desire and effort, based largely upon that analysis, to be of assistance to the men on the ground—the psychiatrists, the medical profession and the public.

Such a course as I have outlined can be accomplished only a little at a time, through the years, and through the education of our membership, along with the development of our territory. As we study our field, we shall find in some states causes of inspiration in colleges, state hospitals, private sanatoria, child guidance and mental hygiene clinics, while in other states we shall be shocked and distressed by colleges having no definite psychiatric instruction, by asylums wherein malarial hyperpyrexia is rarely, if ever, used, where insulin and metrazol are merely names, where thousands of recoverable patients have died simply from lack of food, because they would not eat, where the doctors in charge do not even know that their methods and practices are sub-standard, and where the poorly paid and untrained attendants are compelled to give part of their meagre wages to the political power to which they owe their positions.

Let us get acquainted with the well-equipped psychiatrists in the constantly increasing number of federal institutions being opened in the South, with and through whom we can enlarge our oportunities for helpfulness. Let us cordially accept the suggestions of Dr. Ross Chapman in his splendid and thought-compelling presidential address to The American Psychiatric Association last June, that the relations of the affiliating societies of The American Psychiatric Association (of which we are one of four) should not be perfunctory, but active, and that the interests and efforts of all psychiatric societies and the American Association must be coordinated if we are to meet the challenge of the psychiatric situation. In furtherance of this suggestion, let us get in contact with the appropriate officer or committee of The American Psychiatric Association at an early date with the request that a plan for mutual helpfulness of our associations be worked out.

It seems probable that each society in affiliation with The American Psychiatric Association could become of increasing usefulness to the national body, and in return, receive much benefit from it. When the American Medical Association, The American Psychiatric Association and the Southern Medical Association meet in our territory, we should try to influence as much of their program to be along lines helpful to our aims as would be consistent with an appropriate modesty on our part.

As emphasized by Dr. Chapman in his address, the need for psychiatric education is being more and more realized, and the applications for information and instruction in this field are becoming more insistent in wide-awake communities. To succeed in the stated objects of our association, we must be "wise as serpents and harmless as doves." We must remember our own fallibility and, instead of suggesting arrogance by our behavior, approach those with whom we wish to work with a becoming modesty and a disarming humility.

In what I have outlined, ladies and gentlemen, lies a wonderful opportunity for service to the South. We must not be discouraged by the size of the task, remembering that we can do as much or as little of it as we have strength, time and ability to accomplish. And if we go ahead with enthusiasm, I believe we will be surprised and gratified at the good the Southern Psychiatric Association can do.

PSYCHIATRIC SERVICES IN GENERAL HOSPITALS.

By THOS. J. HELDT, M. D., Detroit, Mich.

Thos. W. Salmon voiced one of his dreams for the future of psychiatry to this effect: "The day is coming when the insane patient will be taken care of right in the general hospital like any other patient. That will happen when people understand him better and when he can be given as much care as other patients instead of one doctor to 350 patients as I saw in one of the hospitals I visited not so long ago." This Salmon dream, here abbreviated and paraphrased, carried a tremendous personal challenge. Opportunity came and in August, 1923, a division of neuropsychiatry was established at the Henry Ford Hospital in Detroit, Michigan. A psychiatrist gave his full time to carefully planting nervous and mental patients among the other patient population of the hospital. No barred windows, no locked doors, no segregation, not even separation of the sexes was permitted. From unobtrusive beginnings the project grew to unqualified success.* The feasibility of treating the psychiatric patient in a properly manned and adequately equipped general hospital is confirmed. The advisability of incorporating a division of neuropsychiatry into the central plan and arrangement of the general hospital, integrating it thoroughly and completely with all the other facilities of the hospital, is also corroborated. Housing the division of neuropsychiatry in a separate building connected by bridge or tunnel to the main hospital is unnecessary and undesirable, if best care of patient and greatest teaching value are sought. Although admission to jail for the active deranged mental patient is still more easily obtained than his admission to a general hospital, the conviction that first appeal should be made to the hospital is growing perceptibly.

In 1923 comparatively few general hospitals anywhere admitted even the advisability of an annex for psychiatric patients, and ex-

* For earlier reports see:

Heldt, T. J.: Functioning of a division of neuropsychiatry in a general hospital. Am. J. Psychiat., 84: 459-476, 1927.

———: Treatment of mental diseases in a general hospital. N. Y. State J. Med., 30: 63-71, 1930.

cept for those provided with such annexes none would knowingly admit a psychotic patient. The mental patient was as diligently isolated as was the patient suffering from scarlet fever. The pest-house attitude truly reigned. Obviously the step of intimately integrating the housing and the care of the mental patient with the care of the other patients in the general hospital was decidedly unorthodox.

Inquiries during 1931 and 1932 disclosed that 69 out of Germany's 3081 general hospitals were provided with a neurological division, only seven could house and care for the mental patient as well. Denmark with upward of 200 general hospitals had only two such hospitals that could care for the psychiatric patient; in Italy there were six among approximately 1600 general hospitals; Scotland three among 156; Canada four among 458. The American Medical Association in 1932, of a total of 4309 *general* hospitals in continental United States, listed 112 as including in their housing facilities a "department for mental patients." As far as could be learned, this "department for mental patients," with one exception, was synonymous with an annex housing plan or some similarly isolated "psychiatric ward." Amalgamation of the medical care of the mental patient with that of the general hospital patient is, however, receiving increasing consideration and attention. Recently Samuel W. Hamilton, of the Mental Hospital Survey Committee, in listing the *general* hospitals giving service to mental patients, named 41 hospitals that have added such service to their facilities since 1932. Hamilton also cited most significantly that Omaha, Nebraska, with a population of 225,000 maintains psychiatric services in five of its general hospitals. Such noteworthy achievement indicates that the "hard and fast-ness" of the psychiatric annex is being softened considerably. Recently, also, Harvey Agnew, Department of Hospital Service, Canadian Medical Association remarked: "In Canada we have four psychiatric divisions or wards, with several other general hospitals admitting a limited number of patients for observation or special treatment."

The favorable effect of the inclusion of the psychiatric patient in the daily program of a general hospital of 600 beds may be readily deduced from the following tabulated summary of activities in the psychiatric division of the Henry Ford Hospital.

Year.	Neuropsychiatric in-patients.	Consultations, other hospital services.	Patients referred from reception service.	Current visits out-patient service.	Relatives interviewed.	Written reports to outside physicians and agencies.
1931	404	678	520	4,821	....	258
1932	480	570	639	4,946	2,208	374
1933	355	601	421	4,200	1,629	363
1934	623	727	537	4,840	2,126	484
1935	635	875	638	5,456	2,083	652
1936	754	964	784	5,804	2,043	786
1937	918	1,051	939	6,271	2,196	874

This tabular excerpt from an experience of almost 15 years emphasizes the opportunities resident in the general hospital for improved care of the mental patient. The increased interest in mental diseases aroused through the intensive therapeutic measures applied to dementia præcox alone is bringing a general awakening which may be very wholesomely fostered by *general* hospitals.

List of General Hospitals, by States, Reporting Facilities for the Care of Nervous and Mental Patients.*

Alabama.

Veterans Administration Hospital, Tuskegee.

Arizona.

Station Hospital, Nogales.

California.

Riverside County Hospital, Arlington.
General Hospital of Fresno County, Fresno.
Golden State Hospital, Los Angeles.
Los Angeles County General Hospital (Units Nos. 1 and 3), Los Angeles.
Highland Hospital of Alameda County, Oakland..
Orange County Hospital, Orange.
Las Encinas, Pasadena.
San Bernardino General Hospital, San Bernardino.
San Diego County General Hospital, San Diego.
U. S. Naval Hospital, San Diego.
Letterman General Hospital, San Francisco.
Stanford University Hospitals (Including Lane Hospital), San Francisco.
U. S. Marine Hospital, San Francisco.
San Francisco Hospital, San Francisco.
Santa Barbara General Hospital, Santa Barbara.
Ventura County Hospital, Ventura.
*University of California Hospital, San Francisco.

* This listing represents hospitals registered by the American Medical Association in 1932, and listings by Dr. Samuel W. Hamilton as late as May 1, 1938. Those preceded by an asterisk are from Dr. Hamilton's list and represent general hospitals which have provided facilities for the care of nervous and mental patients, sometime since 1932.

COLORADO.

Beth-El General Hospital, Colorado Springs.
Colorado General Hospital, Denver.
Fitzsimons General Hospital, Denver.
Veterans Administration Hospital, Fort Lyon.

CONNECTICUT.

New Haven Hospital, New Haven.
*Municipal Hospital, Hartford.

DISTRICT OF COLUMBIA.

Gallinger Municipal Hospital, Washington.
U. S. Naval Hospital, Washington.
Veterans Administration Hospital, Washington.
Walter Reed General Hospital, Washington.
Washington Sanitarium and Hospital, Washington.

FLORIDA.

Veterans Administration Hospital, Lake City.
Florida Sanitarium and Hospital, Orlando.
*Tampa Municipal Hospital, Tampa.

GEORGIA.

Station Hospital, Fort Benning.

ILLINOIS.

Research and Education Hospital, Chicago.
U. S. Naval Hospital, Great Lakes.
Veterans Administration Hospital, Hines.
St. Francis Hospital, Peoria.
*Cook County Hospital, Chicago.
*St. Elizabeth's Hospital, Belleville.
*St. Anthony's Infirmary, Alton.
*Presbyterian Hospital, Chicago.
*University of Chicago Clinics, Chicago.
*Michael Reese Hospital, Chicago.

INDIANA.

Indianapolis City Hospital, Indianapolis.
Indiana State Soldiers' Home Hospital, La Fayette.

IOWA.

Mercy Hospital, Davenport.
University Hospitals, Iowa City.

KANSAS.

Suburban Rest Sanitarium, Wichita.
*Christ's Hospital, Topeka.

KENTUCKY.

Louisville City Hospital, Louisville.

LOUISIANA.

Veterans Administration Hospital, Alexandria.
Charity Hospital, New Orleans.
T. E. Schumpert Memorial Sanitarium, Shreveport.

MAINE.

Farrington Hospital, Portland.

MARYLAND.

Johns Hopkins Hospital, Baltimore.
*Baltimore City Hospital, Baltimore.

MASSACHUSETTS.

Boston City Hospital, Boston.
State Infirmary, Tewksbury.
*Massachusetts General Hospital, Boston.
*U. S. Naval Hospital, Chelsea.

MICHIGAN.

St. Joseph's Mercy Hospital, Ann Arbor.

Battle Creek Sanitarium, Battle Creek.
City of Detroit Receiving Hospital, Detroit.
Henry Ford Hospital, Detroit.
Hurley Hospital, Flint.
*University of Michigan Hospital, Ann Arbor.

MINNESOTA.

St. Mary's Hospital, Duluth.
Veterans Administration Hospital, Fort Snelling.
Ancker Hospital, St. Paul.
Mounds Park Sanitarium, St. Paul.
St. Joseph's Hospital, St. Paul.
Minnesota State Prison Hospital, Stillwater.
*University of Minnesota Hospital, Minneapolis.
*Minneapolis General Hospital, Minneapolis.

MISSOURI.

Veterans Administration Hospital, Excelsior Springs.
Veterans Administration Hospital, Jefferson Barracks.
Kansas City General Hospital, Kansas City.
Kansas City General Hospital No. 2, Kansas City.
Veterans Administration Hospital, Kansas City.
Alexian Brothers Hospital, St. Louis.
St. Louis City Hospital, St. Louis.
St. Louis City Hospital No. 2, St. Louis.
St. Mary's Hospital, St. Louis.
City Infirmary, St. Louis.

NEBRASKA.

Green Gables, Dr. Benjamin F. Bailey Sanitarium, Lincoln.
St. Elizabeth Hospital, Lincoln.
Verges Sanitarium, Norfolk.
Creighton Memorial-St. Joseph's Hospital, Omaha.
Douglas County Hospital, Omaha.
Evangelical Covenant Hospital, Omaha.
Lutheran Hospital, Omaha.
Nebraska Methodist Episcopal Hospital, Omaha.
*Lutheran Hospital, Beatrice.
*Bishop Clarkson Memorial Hospital, Omaha.

NEW JERSEY.

Jersey City Hospital, Jersey City.
Newark City Hospital, Newark.
*Bergen County Hospital, Ridgewood.

NEW YORK.

Albany Hospital, Albany.
*Auburn City Hospital, Auburn.
Kings County Hospital, Brooklyn.
United States Naval Hospital, Brooklyn.
Buffalo City Hospital, Buffalo.
*Presbyterian Hospital, New York City.
Station Hospital, Fort Slocum.
*New York Hospital, New York City.
Bellevue Hospital, New York City.
*Mount Sinai Hospital, New York City.
*Lenox Hill Hospital, New York City.
*Montefiore Hospital for Chronic Diseases, New York City.
United States Marine Hospital, New York City.
Monroe County Hospital, Rochester.
Rochester Municipal Hospital, Rochester.
Strong Memorial Hospital, Rochester.
Grasslands Hospital, Valhalla.

NORTH CAROLINA.

*Duke Hospital, Durham.

OHIO.

Cincinnati General Hospital, Cincinnati.
Good Samaritan Hospital, Cincinnati.
Jewish Hospital, Cincinnati.
City Hospital, Cleveland.
*Deaconess Hospital, Cincinnati.

OKLAHOMA.

Veterans Administration Hospital, Muskogee.

OREGON.

Veterans Administration Hospital, Portland.

PENNSYLVANIA.

Philadelphia General Hospital, Philadelphia.
St. Agnes' Hospital, Philadelphia.
St. Francis Hospital, Philadelphia.
*Temple University Hospital, Philadelphia.
*Conemaugh Valley Memorial Hospital, Johnstown.
*Presbyterian Hospital, Pittsburgh.

SOUTH CAROLINA.

Roper Hospital, Charleston.
*Spartanburg General Hospital, Spartanburg.

TEXAS.

William Beaumont General Hospital, El Paso.
Jefferson Davis Hospital, Houston.
*Parkland Hospital, Dallas.
*John Sealey Hospital, Galveston.
*U. S. A. Station Hospital, Fort Sam Houston.

VIRGINIA.

Norfolk Naval Hospital, Portsmouth.
*United States Marine Hospital, Norfolk.
*Medical College of Virginia, Richmond.
*University of Virginia Hospital, University.

WASHINGTON.

Harborview Hospital, Seattle.
*Seattle General Hospital, Seattle.
*St. Luke's Hospital, Spokane.
*King County Hospital, Seattle.

WISCONSIN.

Hudson Sanatorium, Hudson.
State of Wisconsin General Hospital, Madison.
Sacred Heart Sanitarium, Milwaukee.
Milwaukee County General Hospital, Wauwatosa.
*St. Crashdale Sanitarium, Prescott.

HAWAII.

Queen's Hospital, Honolulu.
Tripler General Hospital, Honolulu.

PHILIPPINE ISLANDS.

Bilibid Hospital, Manila.
Sternberg General Hospital, Manila.

The 153 hospitals in this list have one thing in common. They will admit the mental patient. That every one of the 153 is strictly a general hospital is debatable. Several are decidedly of institu-

tional pattern. Others are more easily classified with the sanatoria. Twelve are Veterans Administration Hospitals, and 18 are of Army, Navy, or U. S. P. H. S. grouping. The full details as to plan of construction and type of service of the reported "department for mental patients" of these 153 hospitals were not ascertained. An inspection visit to each would most certainly be informative and very helpful. From more readily available, although incomplete data, it was deduced that in nearly all cases the provision for psychiatric patients implied a building set aside for them or an established psychiatric annex connected with the general hospital by bridge, tunnel or arcade. In some, separate floors have been isolated or otherwise set apart as psychiatric units or wards. An exception to the isolated housing of psychiatric patients is seen in the Henry Ford Hospital, where since August, 1923, such patients have been cared for on a more intimate basis in their relationships to the other general hospital patients.

RECOMMENDATIONS FOR A MENTAL HEALTH PROGRAM IN HAWAII.

By FRANKLIN G. EBAUGH, M. D., Denver, Colo.

The past few years have seen an increasing amount of interest manifested in mental health and psychiatry. This is true not only in the United States proper, but in its territories, especially Hawaii. This interest in mental health in Hawaii has been sponsored to a large extent by the Hawaii Mental Health Committee, which consists of an impressive group of medical and social leaders of the Territory and which is headed by Mr. Frank E. Midkiff, chairman of the Executive Committee of this group.

In order to broaden the interest in mental health, to define more exactly the problems peculiar to the Territory, and to lay the basis for a more comprehensive psychiatric program, the Chamber of Commerce sponsored a survey of mental health in Hawaii. On the basis of this survey, made during the summer of 1937, the following recommendations were made.

I. Recodification of Existing Laws Regarding the Treatment of Mental Patients.

1. Laws should encourage voluntary admissions to the Territorial Hospital. At present the law permits voluntary admissions for persons suffering from any temporary mental or nervous disorder, but the hospital has definitely discouraged voluntary admissions. The New York State law provides for court commitments only when the patient objects to entering the hospital voluntarily or on a physician's certificate.

   After voluntary admission, to protect the patient and the hospital, provision should be made for legal commitment to the hospital if the physician in charge deems it necessary, and in New York this is done simply by having the physician in charge certify this need to the judge.
2. The present commitment procedure should be changed to abolish warrants of arrest and court hearings. The existing legal procedure treats a mentally ill person as a criminal instead of as a sick man. Booking a mental patient at the police station is unnecessary and undesirable. Certification of the need for treatment by competent physicians should be all that is necessary, and the patient should not be required to appear in court or to hear the testimony. New York and Pennsylvania have model commitment laws which could be copied.

3. Police officers should be replaced by trained representatives of a hospital to effect the transfer of patients from their homes to the hospital or from one hospital to another. Queen's City and County Emergency Hospital attendants could be used when Territorial Hospital attendants are not available.
4. The present positions of Commissioners of Insanity should be abolished, and the parole and discharge of patients put in the hands of the medical staff of the hospital.
5. Such changes in the law as necessary should be made to effect the reorganization of the Territorial Hospital recommended later.
6. Where the issue of mental disease is raised in court cases, expert psychiatric testimony should be provided for by establishing a qualified commission to serve in *all* such cases.
7. Since the law already calls for psychiatric examination of delinquents before their commitment to the industrial schools, it should provide for the means for these examinations.
8. All laws concerning mental hygiene (mental illness, feeblemindedness, defective delinquents, criminally insane, etc.) should be integrated to eliminate inefficiency and duplication.

II. Reorganization of Administration and Treatment Facilities of the Territorial Hospital.

Problems of health are not solved by building hospitals, but depend upon the qualifications of the hospital personnel, both professional and non-professional. The attitudes and objectives of treatment should be in accordance with the best medical practice and enlightened community standards.

1. Division of the functions of the hospital into (a) administrative and (b) medical.
   (a) The administrative functions should be continued as at present under the non-political Board of Health.
   (b) The medical functions should be continued under the Board of Health, but in addition they should be placed directly under a Psychiatric Commission which would act as a liaison between the Board of Health and the hospital. This Psychiatric Commission should be appointed by the Commissioner of Public Health with the approval of the Board of Health, and should consist of two medical members of the Board of Health, two physicians, preferably psychiatrists, and one attorney.

   The functions of the Psychiatric Commission would include determination of the sanity of court cases and of such other cases as may be referred; consideration of appeals from detention made by patients of the hospital; and general consultation and guidance to the director of the hospital and the director of the psychiatric clinic. The action of the Psychiatric Commission would be subject to ratification of the Board of Health except as to decisions as to sanity of cases.

2. Plans should be made to integrate the work of the Territorial Hospital, Waimano Home, the two industrial schools and the prison, and eventually these Territorial institutions might be administered under a central commission, which is the practice in the mainland States with good mental hygiene programs.
3. Reorganization of the Territorial Hospital staff to meet the standards of The American Psychiatric Association for State Hospitals. It is important that what money is spent should be used in obtaining qualified personnel whose main activities should center around the treatment of the patient.

   (a) Medical and administrative personnel. The American Psychiatric Association standards would require one medical director, one administrative assistant, one clinical director, and at least four assistant physicians. However, it is felt that it would be more practical in this case to obtain better men at a higher salary scale by an irreducible minimum personnel of six men, including the hospital executive. At present, the salary scale of the medical staff is lower than that in mainland hospitals.

   The minimum requirements for the training of the medical and clinical directors would be certification as psychiatrists by the American Board of Psychiatry. The qualifications for this certification are:

      (1) Graduation from an acceptable Class "A" medical school.
      (2) Completion of one or preferably more years of general interneship.
      (3) Completion of three years of continuous training in a psychiatric clinic with two years of additional experience in practice.
      (4) Successful completion of the examination conducted by the American Board of Psychiatry.

   (b) Nursing personnel. At present there are ten graduate nurses to 850 patients or one to 85. According to the American Psychiatric standards, there should be one nurse to every 8 patients. Later, arrangements should made for the development of a training school for nurses or for affiliations with other hospital training centers in Honolulu. There should also be arrangements made for the training of attendants, both male and female.

   (c) Other personnel. One, or preferably two, occupational therapists are necessary. These would be graduates of an occupational therapy school. Likewise a trained hydrotherapist, a physiotherapist, and a recreational therapist would be needed. Two trained psychiatric social service workers should be added to the staff. This additional personnel would require adequate buildings and equipment, including a recreation center and more extensive occupational therapy facilities. Treatment facilities and equipment should conform to American Psychiatric Association standards.

(d) Reorganization of clinical service to provide for complete histories, for complete direct examinations, consisting of physical, neurological and psychiatric studies, and for contributory examinations which would require additional laboratory personnel.

III. The Creation of a Territorial Psychiatric Clinic.

This clinic would have the following functions:

1. Follow-up care of patients previously treated and paroled or discharged from the Territorial Hospital. At the present time this important group of patients receives meagre consideration.
2. Examination and treatment of patients showing the earliest stages of the development of mental disorders. This includes many incipient psychoses, a large group of psychoneuroses, special problems of behavior from industrial schools, public schools and social agencies, etc.
3. Examination and treatment of personality and emotional problems of children in need of psychiatric care. It is to be noted here that such a clinic will not duplicate the excellent services already provided in the community by the Pyschological Clinic.

The personnel of this clinic should consist of:

1. A psychiatrist who has had active previous experience and who in addition has been certified through the American Board of Psychiatry and Neurology.
2. Two psychiatric social service workers—both graduates of recognized schools of social service.
3. A consulting psychologist. In this respect, the community is fortunate in having an active psychological clinic headed by Dr. Porteus. He has kindly consented to serve as consulting psychologist in the event of the organization of a psychiatric clinic.
4. A secretary and voluntary assistants.

Since most of the Territorial Institutions using such a clinic—such as the Territorial Hospital, Waimano Home, the Industrial Schools, and Oahu Prison—are already on the Island of Oahu, this Island seems the logical place to begin, but eventually the clinic services should be expanded through traveling clinics to the other Islands. Besides giving more direct treatment service, these traveling clinics would serve an educational purpose throughout the Islands.

The creation and organization of such a Territorial Clinic is the most imperative need at present and should pave the way for an adequate program for mental health similar to what has already been accomplished in the Territory by the Board of Health in relation to physical problems and disease. The appointment of the director of the clinic should be most carefully considered and again it is recommended that his training be such that he has been certified by the American Board of Psychiatry and Neurology. The affiliation of the clinic with a hospital such as Queen's would enable

the director of the clinic to serve on the staff of the hospital, would give the hospital greater usefulness in relation to the general medical profession and would stimulate therapeutic research.

IV. The Development of Psychiatric Departments and Facilities in the General Hospitals in the Community.

In the past, psychiatry has suffered because of its isolation from general medicine. Well-equipped psychiatric divisions in general hospitals are in keeping with modern ideas and principles of the treatment of the person as well as of the disease, and they serve to foster the same general attitude towards mental illness as toward any other type of illness. Integrating psychiatry into the general practice of medicine is in line with modern trends of medical education and hospital practice. In this connection it is to be noted that the management of Queen's Hospital has under consideration the addition of a ten to fifteen bed unit for psychiatric cases. It is felt that such a general hospital unit could treat successfully many types of mental disorders and prevent commitment and prolonged institutionalizations.

V. Community Education.

While mental hygiene is everybody's job, the place of special training and experience must be tolerantly understood. Both lay interest and professional training are valuable, but only when they see their own limitations. Therefore, it is well for the mental hygienist, both lay and professional, to develop and preserve a sense of proportion in relation to his work and, above all, to cultivate that spirit of tolerance and cooperation which is the very essence of mental hygiene itself. In connection with the reorganization of the Territorial Hospital and the creation of a Territorial Psychiatric Clinic, it should be emphasized that both the hospital and clinic have important educational responsibilities in addition to their natural clinical responsibilities of the care and treatment of the individual patient. While excellent educational work is being done now, further development of mental hygiene with the following groups is advised.

1. Parents—that they may realize the full implications of their jobs as parents.
2. Children—that they may form the best habits, attitudes and character traits; that they may acquire self-understanding and self-control, together with the knowledge and insight necessary in handling internal conflicts and in adjusting to society.
3. Teachers—that they may live normal and efficient lives; understand their pupils, adapt themselves to the individual needs of the child and learn to lead and inspire rather than drive and thwart the children in their care.
4. Physicians—that they may have a greater understanding of the mental and emotional factors in the illnesses of their patients, recognize the beginning of mental illness and advise patients more wisely.

5. Judges and jurists—that they may have a better understanding of the mental, emotional and social factors underlying delinquency and crime and may develop understanding and a more tolerant attitude toward the services offered by psychiatric clinics and psychopathic hospitals.
6. Clergymen—that they may distinguish between sinfulness and illness, understand better the causes and conflicts of marital incompatibilities and become sensitive to the mental, emotional and social maladjustment of some of their flock.
7. Employers and employees—that they may learn greater understanding and become more tolerant of the needs of each other.
8. The public in general—that it may support wise measures for the promotion and preservation of mental health, take a more hopeful and less prejudiced attitude toward the mentally ill, and support the better study and care of mental patients and other poorly adjusted persons, such as the delinquent and the criminal.

VI. Organization of a Mental Hygiene Committee.

This committee could be an amplification and further development of the present Mental Health Committee. It should be organized under the auspices of the Chamber of Commerce, the Territorial Medical Society and the Council of Social Agencies and it should assume responsibility for the development of better mental hygiene in the Territory and for the promotion of psychiatric treatment resources. Committee responsibility for continuance of interest in and carrying on of a program is essential. The community is to be congratulated on the intelligence of the social workers and public health nurses in this field, but they need medical leadership and will continue to seek it until it is provided for them.

In summarizing these recommendations, it may be noted that there is a widespread community recognition of the problems of mental illness in Hawaii, but the medical profession needs to take more active leadership in meeting the needs; that the development of psychiatric treatment resources in a general hospital would stimulate this needed medical leadership; that the beautiful Territorial Hospital, erected in 1930, cannot give proper treatment to its 867 patients until clinical organization is developed within it; and, finally, that the treatment of mental illness must necessarily go back to the community setting in which so much of it originates, and that this can be accomplished through the development of a community psychiatric clinic. These developments require both official and private support, but the outlook is very hopeful and a sound basis already exists.

It is gratifying to note that plans are now under way for the fulfillment of many of these recommendations. At the present time, Queen's Hospital is constructing a psychiatric unit, and it is

probable that a psychiatric clinic in Honolulu will soon be developed to serve as an educational and clinical center in cooperation with existing institutions. It is anticipated that traveling clinics will be organized for the remaining islands. Hawaii has long been considered a model in the standards of physical health and sanitation, and it may be expected that similar facilities for mental health will be created and maintained. The best of wishes and congratulations of the psychiatric profession are offered in furthering these objectives.

The Hawaii Mental Health Clinic.

The Hawaii Mental Health Clinic first began to function in August, 1938, under the direction of Dr. Franklin G. Ebaugh. This clinic was organized at Queen's Hospital where both out patient and in patient facilities were created. The provision at Queen's Hospital consisted of 11 beds with satisfactory nursing, occupational therapy, hydrotherapy and recreational facilities. The out patient department was conducted on an appointment basis, and the services of a well trained social service worker, consulting psychologist and secretary were available. A mobile clinic was organized on the islands of Hawaii, Maui and Kauai, under the auspices of the County Medical Society.

During this demonstration period 148 patients were examined. Of these 57 were treated in the out patient clinic, Queen's Hospital, 46 patients were admitted to the psychiatric unit, Queen's Hospital, and 45 patients were examined in the community clinics. These patients consisted of referrals by doctors, of follow-up cases for the Territorial Hospital, by the courts, by social agencies and by voluntary application. There was a large waiting list.

Educational activities of the clinic centered around numerous conferences with relatives, physicians, clinics held at Queen's Hospital, County Medical Society talks on other islands and a series of talks on Oahu.

Dr. Edwin E. McNiel, former chief resident of the Payne Whitney Clinic, was appointed as director of the clinic following the demonstration period. This clinic was organized under the auspices of the Honolulu Chamber of Commerce and the Territorial Medical Society, and appears to be a very promising development upon which the medical profession of Hawaii are to be congratulated.

NARCOTICS CONTROL BY LAW IN THE UNITED STATES.

By JAMES E. HUGHES, LL. B.,[1]

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The non-medical user of narcotics continues to be one of psychiatry's problems. It may be vicariously pleasurable to contemplate the day when the sealing of all loopholes in the narcotic statutes will cause the disappearance of this species of the maladjusted. It would be a greater pleasure to visualize an era when psychiatry shall have eliminated the underlying causes of man's sense of insecurity and his feeling of need for reliance on drugs. Such contemplation and visualization of the addictions solution must, however, be put aside while thought is given to the business at hand of keeping in touch with what society is doing (and failing to do) through its elected representatives to prevent the non-medical use of narcotic drugs.

Since a draft of a uniform state narcotic drug law was approved by the National Conference of Commissioners on Uniform State Laws at its 42d annual conference in 1932, it has been enacted into law by all states except 9,[2] and the District of Columbia.

This model act defines "physician" as "a person authorized by law to practice medicine in this state and any other person authorized by law to treat sick and injured human beings in this state and to use narcotic drugs in connection with such treatment." It provides, relative to professional use of narcotic drugs, that "a physician or a dentist, in good faith and in the course of his professional practice only, may prescribe, administer and dispense narcotic drugs, or he may cause the same to be administered by a nurse or interne under his direction and supervision." It requires a record to be kept of narcotic drugs received, administered, dis-

[1] Member of the District of Columbia Bar, and Instructor in Social Legislation, Washington School of Psychiatry, Washington, D. C.

[2] California, Kansas, Maine, Massachusetts, New Hampshire, North Dakota, Pennsylvania, Vermont and Washington. The 1937 regular session of the state legislatures adjourned in all of these states without enacting the uniform law.

pensed or professionally used otherwise than by prescription. Certain enumerated solutions for local application are excepted from this particular record-keeping requirement although other records thereof must be kept, and there is a proviso that "no record need be kept of narcotic drugs administered, dispensed or professionally used in the treatment of any one patient, when the amount administered, dispensed or professionally used for that purpose does not exceed in any 48 consecutive hours, (a) four grains of opium, or (b) one-half of a grain of morphine or of any of its salts, or (c) two grains of codeine or of any of its salts, or (d) one-fourth of a grain of heroin or of any of its salts, or (e) a quantity of any other narcotic drug or any combination of narcotic drugs that does not exceed in pharmacologic potency any one of the drugs named above in the quantity stated."

Section 15 of the recommended draft, relative to the revocation of professional license for violation of the act, provides as follows: "On the conviction of any person of the violation of any provision of this act, a copy of the judgment and sentence, and of the opinion of the court or magistrate, if any opinion be filed, shall be sent by the clerk of the court, or by the magistrate, to the board or officer, if any, by whom the convicted defendant has been licensed or registered to practice his profession or to carry on his business. On the conviction of any such person, the court may, in its discretion, suspend or revoke the license or registration of the convicted defendant to practice his profession or to carry on his business. On the application of any person whose license or registration has been suspended or revoked, and upon proper showing and for good cause, said board or officer may reinstate such license or registration." Relative to privileged communications between physician and patient, the draft contains this provision: "Information communicated to a physician in an effort unlawfully to procure a narcotic drug, or unlawfully to procure the administration of any such drug, shall not be deemed a privileged communication."

Only one who is somewhat familiar with the slow and uncoordinated development of narcotic control measures by the states [3]

[3] See Supplement No. 91 to the Public Health Reports, prepared by direction of the Surgeon General, United States Public Health Service, wherein, at page vi, it is stated that "The abuse of narcotic drugs involves economic, social, moral and public health questions that collectively remove antinarcotic

prior to the draft of the model uniform law can realize the subsequent great activity by the states in the matter of narcotic control legislation, which is shown by the fact that in the short space of five years 39 states have enacted a new and uniform narcotic act. This activity is, in great measure, due to the fact that the model act was recommended by the National Conference of Commissioners on Uniform State Laws, which is composed of representatives from each state and which had had some 42 years' experience in drafting model laws to meet situations in which it was desirable that the laws of the states be uniform. Some persons see in such a recommended draft of a model state law some semblance to a constitutional amendment, since it is the work of representatives of each state and, if enacted by each state without change, renders the law on the subject uniform throughout the United States. Regardless of such seeming analogy, however, it is apparent that the states have awakened to the fact that the control of narcotic drugs within their respective borders is something of local as well as national concern if they are to fulfill their duty in the matter of protecting the health and welfare of their citizens.

The states have not shown the same attitude with regard to the care and treatment of the victims of the narcotic evil. Notwithstanding the fact that the states have been aware of the existence in considerable numbers of these sick persons for many years,[4] 12 states had, after the adjournment of the 1935 legislatures, no statutes authorizing institutional treatment of narcotic addicts; and 18 states had no statutory provision for the compulsory commitment of such persons to public institutions. (See appended table.)

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laws from the category of legislation that is generally considered to be of a controversial nature, and the attitude of the community in regard to the enactment of such laws is general indicative of the fact that they are of necessity of a public health nature and that any economic problems that may be involved should be considered as being of but secondary importance. The failure of many states to enact adequate narcotic laws may therefore be considered to be more often the result of lethargy on the part of legislators rather than any reaction of the community to the enactment of such laws."

[4] See pp. 5 and 9 of Supplement 91, which shows that the first law authorizing the commitment of narcotic users was enacted by the State of Connecticut in 1874, whereas the first narcotic control law was enacted in 1877 by the State of Nevada.

SUMMARY OF STATE LAWS RELATING TO THE COMMITMENT OF NARCOTIC ADDICTS.[1]

State.	Compulsory commitments.		Voluntary commitments.		Total provisions.
	Public institutions.	Private institutions.	Public institutions.	Private institutions.	
Alabama [2]	X [3]	X [4]	X	....	3
Arizona	X [5]	....	....	....	1
Arkansas	....	....	....	....	0
California	X [6]	....	....	....	1
Colorado	X	....	....	....	1
Connecticut	X [7]	X	X	X	4
Delaware	X	....	....	....	1
Florida [2]	X [4]	X	X	....	3
Georgia	X [4]	X	X	X	4
Idaho	X	X	....	....	2
Illinois	....	....	....	....	0
Indiana	....	....	....	....	0
Iowa	X	....	....	....	1
Kansas [8]	....	....	....	....	0
Kentucky	....	....	X	....	1
Louisiana	X [4]	X [4]	X	X [9]	4
Maine	....	....	X [10]	....	1
Maryland	X	X	....	X [9]	3
Massachusetts	X [11]	X	X	X	4
Michigan	X [12]	....	....	X [9]	2
Minnesota	X	X	X	....	3
Mississippi	X	X	....	....	2
Missouri	X	....	X	....	2
Montana	X	....	X	....	2
Nebraska	X	....	....	....	1
Nevada	X [5]	....	....	....	1
New Hampshire	....	....	....	....	0
New Jersey	....	....	....	....	0
New Mexico	X	....	X	....	2
New York	X [4]	X	X	X	4
North Carolina	X	X	X	....	3
North Dakota	....	....	....	X [9]	1
Ohio	....	....	....	....	0
Oklahoma	....	....	....	X [9]	1
Oregon	....	....	....	....	0
Pennsylvania	X	X	X	X	4
Rhode Island	X	X	X	X	4
South Carolina	....	....	....	....	0
South Dakota	....	....	....	....	0
Tennessee	....	X	....	....	1
Texas	X [5]	X [5]	X	X	4
Utah	....	....	X	....	1
Vermont	X	X	X	X	4
Virginia	X	X	....	X	3
Washington	X	....	X	....	2
West Virginia	....	....	....	....	0
Wisconsin	X [13]	....	X	....	2
Wyoming	....	....	....	....	0
Total	30	18	21	14	83

(*Footnotes on page 885*)

Therefore, during the time that the draft of the model narcotic law was being studied by the committee which had been appointed by the Conference, the Surgeon General of the United States Public Health Service presented to the chairman thereof for consideration the necessity of adequate provision by the states for the care and treatment of persons addicted to the habitual use of narcotics. The committee, in a prefatory note to the publication which contained the approved draft of the narcotic act, stated that provision in regard to this feature of the narcotic problem was omitted from the act so that each state might provide its own method for the care and cure of addicts and observed that "The subject of addiction and its cure, however, is so important that no state should delay in making immediate and thorough study of this great social problem." There is no doubt that, notwithstanding international, federal, and state control measures, the problem of the narcotic user is still one of considerable importance; but as a result of progress in medicine and particularly in psychiatry, the attitude is now expressed in the question "What can we do for these patients?" rather than as "What shall we do with dope fiends?"

It is now agreed by all who have had any contact with users of narcotics, including wardens and jailers, that no such person was ever cured of the craving for drugs by throwing him into a cell and letting him "kick it out." The man in the street is beginning to realize that speculation as to whether narcotic addiction is a disease or a vicious habit serves no constructive end. The fact remains that such persons are generally a liability to society; and until the basic physical and mental phenomena of their convictions that they need the administration of narcotic drugs are fathomed,

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[1] Including laws enacted during the 1935 regular legislative sessions.
[2] Also attempts to authorize commitments to federal institutions.
[3] Defendants in criminal actions, proceedings or sentence being stayed.
[4] Including defendants in criminal actions, proceedings or sentence being stayed.
[5] Only violators of narcotic control law.
[6] Including juvenile court cases and defendants in criminal actions, proceedings or sentence being stayed.
[7] Including "common drunkards," or persons three times convicted of intoxication, and women over 16 years of age convicted of the offense of "drug-using."
[8] Authorizes appointment of guardian who is given charge of person; court may make order for care and safekeeping.
[9] At the expense of the state.
[10] Provides for commitment, upon voluntary written agreement to restraint, to "any general hospital receiving aid from the state or any legally qualified physician of not less than 5 years' actual practice."
[11] Including defendants in certain criminal actions.
[12] Including convicted narcotic law violators and petty offenders, in lieu of sentence.
[13] Persons convicted of using narcotic drugs "habitually, excessively, or except in pursuance to a prescription for permitted use as prescribed" in state law.

no substantial progress will be made toward restoring them as useful members of the community and preventing the suffering, broken homes, crime and financial burden which their addiction entails.[5] Probably no layman to the medical profession deserves more credit for making the American people conscious of the medical and public health problem represented by the presence in their midst of many thousands of drug users, who seem unable to resist the inclination to make recruits to their ranks, than the late Honorable Stephen G. Porter. In addition to the leading part which Congressman Porter took in the international negotiations by the United States for the control of narcotics, his untiring efforts resulted in the enactment of the law authorizing the establishment of two United States Narcotic Farms for the care and treatment of federal prisoners and probationers, and voluntary patients, who are addicted to the use of narcotics.[6]

An inspection of the above table, from which many of the details of the various laws are omitted, will show the great lack of uniformity which exists among the states in their approach to the institutionalization problem; and there cannot but come to mind the need for study of this phase of narcotic addiction by some such coordinating agency as the National Conference of Commissioners on Uniform State Laws. The need for such study is hardly less than the need for a uniform general commitment law, under which the institutionalizing of the mentally ill would be more humane, scientific and economical.

[5] The writer's views are influenced by his having handled the applications of several hundred addicted persons for voluntary admission to the United States Public Health Service Hospital, Lexington, Kentucky, as well as correspondence with relatives, friends, family physicians, lawyers and others, and by personal interviews with applicants.

[6] See "Hearings Before the Committee on the Judiciary, House of Representatives, 70th Congress, on H.R. 12781 and H.R. 13645, Serial 29 (Revised print)," U. S. Government Printing Office, Washington, 1928.

THE KORSAKOFF PSYCHOSIS IN SPONTANEOUS SUBARACHNOID HEMORRHAGE.

Report of Three Cases.*

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It is a paradox of medical nomenclature that the symptom complex variously known as Korsakoff psychosis or polyneuritic psychosis deserves neither of these two appellations. Korsakoff [1] gives Magnus Huss credit for first describing the amnestic-confabulatory symptom complex, and he also emphasized from the outset that the mental picture was not characteristic of only alcoholic polyneuritis, but could be symptomatic of a large variety of diseases; the cases he described in alcoholics are by far in the minority. He [2] made the observation that the psychosis could appear in intra-uterine infections, puerperal septicemia, fecal obstruction, typhus, tuberculosis, diabetes mellitus, icterus, lymph-adenoma, tumors and intoxications by arsenic, lead, carbon-disulphide, carbon monoxide and ergot. In another paper [3] published the same year he documented the appearance of the psychosis in icterus following treatment with Fowler's solution, abdominal typhus with pulmonary tuberculosis, typhus, alcoholism complicated by lues and malaria, regressive changes in a fibroma in a chronic alcoholic and in uncomplicated chronic alcoholism. In another early contribution, Serbsky,[4] Korsakoff's co-worker, reported the mental syndrome in patients suffering from infected dermoid cyst of the abdomen with sepsis, erysipelas and alcoholism, and uncomplicated chronic alcoholism.

The psychosis has been reported in polyneuritis, non-alcoholic in nature. Several such cases, not very well documented, however, are reported by Minski.[5] A case of polyneuritic psychosis caused by diabetes is reported by Balado and Bibiloni.[6] Their patient, however, suffered from vomiting which in itself could have led to a state of avitaminosis [7] with its recognized sequelæ. The authors

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failed to evaluate the factor of vomiting. This point has undeniable importance, since the Korsakoff psychosis has been reported in intractable vomiting [8] unassociated with polyneuritis, in pernicious vomiting of pregnancy. A thorough presentation of the subject of this psychosis in pernicious vomiting of pregnancy was presented by von Hösslin [9] in 1905. Other authors [10] have presented the same. Ely [11] reported cases resembling the Korsakoff psychosis in the same condition. The psychosis has been reported in diabetes mellitus by others.[12, 13]

A large variety of infectious and inflammatory processes have shown the symptomatic Korsakoff psychosis. It has been reported in direct involvement of the central nervous system, such as anthrax meningo-myelo-encephalitis,[14] epidemic cerebrospinal meningitis,[15] acute encephalitis,[16] epidemic encephalitis,[17, 18] the post-encephalitic syndrome,[19] lymphogranulomatosis,[20] general paralysis [21] and cerebrospinal syphilis.[22, 23]

The psychosis may appear in non-neural infections with secondary systemic effects, such as acute rheumatic fever,[24] lymph node tuberculosis,[25] malaria,[26] perirectal abscess or fever of unknown origin.[27] Kleist [28] reported fragments of a Korsakoff psychosis following operation for rectal carcinoma. As early as 1904 the psychosis had been reported following head injury.[29] It has since been reported by others.[30, 31, 32, 33] It has been reported following operation for post-traumatic frontal cyst.[34]

The psychosis is fairly well known after carbon monoxide intoxication,[35, 36] and has been described in cocaine intoxication.[37]

It has been reported in association with pernicious anemia. Pickett [38] in 1904 presented the problem of Korsakoff symptoms appearing in conjunction with pernicious anemia. Bonhöffer,[39] in 1911, discussed the same. Barrett [40] reported two cases of pernicious anemia with a tendency to confabulation in the setting of a severe organic confused reaction. Parfitt [41] reported the psychosis in a chronic alcoholic with pernicious anemia.

It has been described in third ventricle tumors,[42] in a cyst of the third ventricle with cure of the psychosis on removal of the tumor,[43] in hypothalamic disease,[44] and following operation for suprasellar tumor.[43]

It has been described in beri-beri [45] and in leprosy.[46] The psychosis has been described in a patient suffering from Adie's syndrome and pernicious anemia.[47]

The incidence of the Korsakoff psychosis in subarachnoid hemorrhage is not very high. Goldflam,[48] in 1923, discussed the symptomatology of 13 cases of subarachnoid hemorrhage, described the Korsakoff psychosis, but presented no detailed case reports. He referred to Flatau as being the first to describe the psychosis in subarachnoid hemorrhage. Flatau's [49] paper in 1921 gives an excellent description of the mental picture but no detailed case reports, and merely records that the author had seen the psychosis in a number of patients with subarachnoid hemorrhage. His earlier (1918) paper [50] was not available to this writer. In 1925, Herman,[51] in reporting 18 cases of subarachnoid hemorrhage, mentioned the psychosis as a symptom but did not present any case material. He referred to the previous work of Flatau and Goldflam. Herman,[52] again in 1926, in a very extensive review of the problem of subarachnoid hemorrhage, described the Korsakoff psychosis as a symptom but presented no case material and gave no hint as to its incidence. He again referred to the two previous writers and also to Mackiewicz [53] in the Polish literature. Hall [54] reported in detail two cases of Korsakoff psychosis in subarachnoid hemorrhage. Cubitt [55] reported a case in detail, with post-mortem findings. Popow [56] reported another case. Kulkow,[57] in discussing the symptomatology of 31 cases of subarachnoid hemorrhage, described one case of his own with Korsakoff psychosis, and also referred to one case of Korsakoff psychosis among the 10 cases of subarachnoid hemorrhage reported by Jores.[58] Closer scrutiny of Jores' case reveals it to be an organic type of delirious reaction with amnesia but with no elements of confabulation. Bumke and Foerster's *Handbuch* [59] mentions Korsakoff psychosis in subarachnoid hemorrhage but gives no case reports and gives no hint as to its incidence.

It will be seen from the foregoing review that while Korsakoff psychosis is known in subarachnoid hemorrhage, it is not common. The incidence can be roughly gathered from the fact that the three case reports which follow were culled from a series of 105 cases of subarachnoid hemorrhage studied by Strauss and Tarachow.[60] Case 3 has been previously included in a study by Strauss, Globus and Ginsburg.[61]

Case Reports.

Case 1.—H. R., a 15-year-old-female. Entered with a classical picture of spontaneous subarachnoid hemorrhage. Five days after the onset she first showed signs suggesting Korsakoff psychosis. She developed the classical picture of mild euphoria, lability of mood, memory defect and confabulation. She returned to a normal state in three weeks, but with a persistent amnesia for a period of four weeks, beginning with a week before the onset of the subarachnoid hemorrhage. She was discharged and followed for about two years, at the end of which time she was mentally normal, with a tendency to a hypomanic temperament.

History.—One week before the acute onset, the patient stumbled and fell, but suffered no head injury and had no symptoms. Careful questioning revealed no relationship between this fall and the acute onset of the illness. At 7.10 a. m. on October 17, 1934, the patient suddenly called to her mother saying she was not feeling well. The mother found her kneeling over the toilet seat, vomiting and complaining of intense headache and dizziness. The girl then had a bowel movement following which she broke out into a diffuse cold sweat. She was put to bed, and was found unconscious one hour later. Her temperature was 98.4° F. Five hours later she was incontinent of urine, and mumbled a few words. Seven hours after the onset her temperature was 102° F. There were involuntary movements of the hands, and her eyes rolled from side to side. She was in the fourth day of a menstrual period. The past history was essentially negative.

Status on Admission.—She was admitted to the Mount Sinai Hospital 10 hours after the acute onset. She was acutely and severely ill, restless and stuporous, at times responding, and then sinking back into coma. Temperature was 102° F., respirations 26, pulse 120. Blood pressure was 112/54. Her skin was warm, moist, and showed several scattered petechiæ over the hand, abdomen and angle of the jaw. There was a variable stiff neck, bilateral Kernig, and at times a positive Brudzinski. There was a deviation of the head first to one side and then to the other. There were occasional twitching movements of the fingers, more on the right. The reflexes were all obtained and equal, though slightly depressed. There were bilateral Babinski, Oppenheim, Gordon and Rossolimo signs. The abdominals were more active on the left. The nasal margin of the left optic disc was blurred, and there were numerous pin-point, flame-shaped and linear hemorrhages in the left retina. The pupils varied in size and reaction, at times being small and fixed, at other times dilated and sluggish. There was a divergent strabismus and spontaneous dissociated eye movements.

Laboratory Findings.—The spinal fluid was under an initial pressure of 340 mm. of water; it was uniformly bloody, and the supernatant fluid was xanthochromic. The cell count of the spinal fluid showed 250,000 red blood cells, 500 white blood cells with a normal differential count. The urine was entirely negative. The blood picture showed a hemoglobin of 82 per cent and a red count of 4,500,000. The white cell count was 19,000 with a differ-

ential of 80 per cent polymorphonuclears, 18 per cent lymphocytes and two per cent monocytes. Blood and spinal fluid Wassermann reports were negative.

Progress in the Hospital.—For the first five days the patient was in a restless stupor, was drowsy and incontinent; a spinal tap showed the fluid to be uniformly bloody. On the fifth day she began to confabulate; the confabulations lasted for two weeks. During this time she was difficult to manage, was euphoric and noisy. Though she was alert and active, she was disoriented for time and place; there were defects of memory, retention and recall. "I saw you at the football game. I was home today. I made a pest of myself to my mother and then I went to see Dr. R. I had a lot of fun with his daughter. I hopped home with one foot. I walked you know. I walked with a crutch. Someone told my mother I hurt my foot. My mother shipped me back." In the fourth hospital week she ceased confabulating. She began to improve though the euphoria continued. A spinal tap showed only 20 red blood cells. She continued to improve to the time of discharge, November 17, at which time she was mentally normal but showed a retrograde amnesia involving the week before the hemorrhage occurred and the first three weeks of the hospital stay.

Follow-Up Notes.—A letter from the referring physician: "The patient has been seen by me on two occasions since her discharge from the hospital, the last time being June 29, 1935. At that time the noteworthy findings were prominent eyeballs, unusually well developed secondary sex characteristics and a more or less hypomanic mood reaction. I believe that all these findings are part of her constitution and personality and have nothing to do with her illness for which she was sent to the hospital. She has no subjective complaints and is making good progress in school."

May 1, 1936. Patient doing well and seeing her private physician regularly.

Case 2.—R. B., a 33-year-old female. This patient entered the hospital with the classical picture of a severe spontaneous subarachnoid hemorrhage. She was in a restless stupor for about one month and then developed a hypomanic syndrome. Two months after admission she developed a Korsakoff psychosis with mild euphoria, memory defect and confabulation. There was a gradual recovery. Encephalogram showed internal hydrocephalus with no air in the subarachnoid space. She was discharged two and one half months after admission with some elements of the psychosis persisting. Three months later the mental state was practically normal, though she was overactive and cheerful.

History.—The past history was essentially negative. She had been married 14 years and had two children. Two brothers suffered from dementia præcox and were in State Hospitals. There was no other mental disease in the family. The patient had always been well mentally. The present illness began acutely four days before admission. Following a sudden twist of the neck she suffered a momentary sharp shooting pain in the frontal region. This gradually became more severe. There were generalized weakness, dizziness, vertigo, aches and pains all over the body, especially the back, legs and buttocks. She was nauseated and vomited. These symptoms lasted one day

and then disappeared. Three days later the symptoms recurred, and she suddenly lapsed into coma. She was admitted to the Mount Sinai Hospital May 21, 1935.

Status on Admission.—She was an obese white female, acutely ill and in severe pain. Temperature was 98.6° F., pulse 54, respirations 22, and blood pressure 108/65. There was percussion tenderness over the skull. There was a stiff neck and bilateral Kernig. She was friendly and laughed readily in spite of her severe headache. She yawned frequently. Recent memory was impaired; there were errors in simple calculation, and difficulty in retention. Orientation for place and person was intact, for time approximate. She was bedridden. The right leg was everted; of the deep reflexes the biceps jerks only were obtained. There was no Babinski, but bilateral equivocal Chaddock. Motor power was better in the left extremities. There was weakness of the right face. The pupils were equal; there was an alternating strabismus; the left fissure was wider than the right.

Laboratory Findings.—Spinal fluid was under an initial pressure of 240 mm. of water and was almost pure blood. The blood count showed 6,100,000 red blood cells, 14,900 white blood cells with a normal differential count. The urine showed a trace of albumin but was otherwise negative. The serological findings in the blood and spinal fluid were negative.

Progress in the Hospital.—During the first week the patient was in a semi-stupor; she was drowsy and incontinent. She had an attack of sudden tonic spasms which was interpreted as evidence of fresh bleeding. The spinal fluid continued to be grossly bloody. In the third week there was a distinct change; she showed hypomanic behavior, was alert, overtalkative, showed flight of ideas, sang, made rhymes. The spinal fluid cleared up but then again showed evidence of fresh bleeding. There were transient paranoid trends and auditory hallucinations. When the spinal fluid was clear an encephalogram was done; this showed a symmetrical internal hydrocephalus with practically no air in the subarachnoid space.

Two months after admission the patient showed the classical features of the Korsakoff psychosis. There was a severe organic mental defect syndrome; she was completely disoriented for time; there were marked defects of retention, recall and general knowledge. Confabulations were glib, "A lady gave birth. I heard that a woman had to give birth to a baby and they had to give some medicine, some powder. I stay out in the park and read. I'm living here, in this apartment house. I'm a tenant. I read, sew, wash, do things for the children." The patient's general condition was sufficiently improved, 17 days after the onset of the Korsakoff psychosis, to permit discharge, though she was still confabulating, was euphoric, and showed elements of an organic reaction type.

Follow-Up Notes.—November 14, 1935. Mental condition improved remarkably. Calculated well, oriented for time, place and person. Immediate retention good. She gave almost the exact date of discharge from the hospital. There was still euphoria and an active, assured way of speaking.

May 14, 1936. General condition very good. Superficially the mental condition was excellent. No sensorial defects; quite cheerful.

CASE 3.—A. E., a 58-year-old widow. This patient entered with a severe subarachnoid hemorrhage with slight focal signs and signs of increased intracranial pressure. A ventriculogram showed a symmetrical internal hydrocephalus. The patient showed aphasic symptoms and evidence of disorientation and clouding, at times of Korsakoff psychosis. She was discharged five weeks after admission. Her mental state suddenly returned to normal three days after discharge. She was followed for six years; there were no recurrences; her mental state remained essentially the same.

History.—Three years previously the patient fell on her head but suffered no ill effects and no sequelæ. Three months before admission the patient suffered a sudden nocturnal attack of headache and projectile vomiting. For one week the patient was in bed and was drowsy. She was then symptom free for one month, and then had another attack of headache, pain in both eyes and vomiting. The patient was admitted to Mt. Sinai Hospital September 8, 1930.

Status on Admission.—She was well nourished; the tongue was coated; there was diffuse spine tenderness; neither dorsalis pedis pulse was palpable. Temperature was 100° F., pulse 78, respirations 28, and blood pressure 130/80. The gait was slow and cautious. There was a stiff neck, positive Kernig and Brudzinski signs. The tendon reflexes were active and equal, the abdominals were diminished on the right. There was a positive Babinski on the right and an equivocal one on the left. There was bilateral papilledema, greater on the right, and retinal arteriosclerosis. The pupils reacted well to light and in accommodation, but were unequal in size, the left being greater. There was a loss of convergence and bilateral exotropia. Mentally the patient was clouded, dull and apathetic. She had difficulty understanding simple commands; her replies were delayed. There was perseveration. She was disoriented in all spheres. Remote and recent memory were impaired. There was lack of insight.

Laboratory Findings.—The spinal fluid was under an initial pressure of 200 mm. of water, was uniformly bloody and showed supernatant xanthochromia. The urine showed a faint trace of albumin. The blood picture was normal. The serological studies of the blood and spinal fluid were normal.

Progress in the Hospital.—There continued to be marked psychomotor retardation. Because of the papilledema it was felt necessary to rule out a brain tumor. A ventriculogram was done and revealed a moderate diffuse enlargement of the lateral and third ventricles; the iter was slightly dilated; there was some air in the left parietal region. Mental changes continued to be severe; she was disoriented and retarded. She was unable to carry out written commands, was unable to name objects, she confused right and left. In the third week she became alert and cooperative, though an organic defect syndrome persisted. She filled in her memory defects with confabulations. She said the hospital was a church and the staff were to participate in the services. She improved and was discharged October 13, one month after admission.

Follow-Up Notes.—Three days after discharge from the hospital the family reported that her mental condition suddenly returned to normal except for an amnesia for all the events of the hospital stay.

The patient was followed for the next six years, to November 12, 1936. She continued to be free of signs or symptoms. She was mentally normal; there was only occasional headache. With the exception of an operation for cholecystitis during this period she continued to be in good health.

Discussion.

Several features deserve discussion. Case 1 is quite young, the patient being only 15 years of age. That is, however, not distinctly unusual, spontaneous subarachnoid hemorrhage having been reported in a six-month-old child,[62] and a Korsakoff psychosis with alcoholic polyneuritis having been reported in a seven-year-old child.[63] In addition, in Case 1, the subarachnoid hemorrhage set in on the fourth day of a menstrual period, suggesting the possibility of a relationship between the menstrual and subarachnoid bleeding. This relationship has been noted by other authors.[64]

All three of the patients here reported recovered and returned to their normal mental state. This is in agreement with most others,[48, 49] who report remissions of the psychoses if the patients recover from the subarachnoid hemorrhage and who believe that consequently the brain changes are reversible, though Bumke and Foerster disagree.[65] It is interesting to note that the personalities of the patients after their recovery remained at a level of extroversion, activity and cheerfulness, suggesting perhaps a hypomanic mood. These characteristics were claimed to be elements of the patients' normal personalities. This might indicate that either the previous personalities of the patients were factors in the causation of the psychoses or that the relatives of the patients were not entirely honest in their evaluation of the recovered patients. In view of the aerographic changes it is easy to believe that some permanent organic changes could have been induced with residual mild and difficultly detectable changes in personality.

Case 2 suffered repeated hemorrhages while under observation. This has been felt by some [57] to be an important factor in causing the Korsakoff psychosis. While this may be true in some instances, it is not characteristic of the other cases reported in the literature.

The aerographic studies are of interest and importance. In Case 2 they demonstrate two important features, first, symmetrical internal hydrocephalus, and second, the relative absence of air in the subarachnoid space. Case 3 demonstrates a similar

internal hydrocephalus, but since the air was introduced by ventricular puncture the absence of air in the subarachnoid space has no significance. The most likely underlying process is a sterile plastic meningeal reaction due to the presence of the blood as a foreign body in the subarachnoid space. The space would then tend to be sealed off and so interfere with resorption of cerebrospinal fluid. Experimental work [66] on the injection of blood into the subarachnoid spaces and cisternæ of puppies and dogs has definitely shown that a plastic thickening of the meninges occurs, most marked at the base, and is accompanied by distinct internal hydrocephalus and sometimes by external hydrocephalus. The development of an internal hydrocephalus due to a plastic process in the meninges at the base of the brain has been termed communicating hydrocephalus, in contrast to obstructive hydrocephalus due to a block in the ventricular system itself. The pathophysiology of communicating hydrocephalus has been clearly demonstrated experimentally and clinically by Dandy and Blackfan [67, 68, 69] in their original work. Globus [70] reported the case of a child who developed a communicating hydrocephalus following a trauma and probable subarachnoid hemorrhage. Case 2 of this paper would seem to be an excellent example of communicating hydrocephalus due to a plastic process in the basilar meninges.

Both the profundity of the mental changes and the evidence from the air studies would lead one to expect that the brain changes are of a severe nature. It is doubtful whether it is possible to make a correlation between definite localizable changes in the brain and the Korsakoff mental picture. Bagley's [66] experimental work on the introduction of blood into the subarachnoid spaces of dogs demonstrated the existence of small areas of cortical damage where the blood had penetrated into the depths of the sulci. However, Cubitt,[55] in his autopsied case of Korsakoff psychosis with subarachnoid hemorrhage, found the cortex remarkably uninjured. Strauss', *et al.*[61] autopsy material certainly showed that subarachnoid hemorrhage can be accompanied by injury to the brain cortex, although the relation between the Korsakoff psychosis and the extent and location of the organic brain changes still remains unclear. It is quite possible that the hemolyzed blood acts as a toxic agent. This was suggested by Carmichel and Stern,[71] who point to the latent interval between the onset of the subarachnoid

hemorrhage and of the mental syndrome. They found a latent interval of three weeks in the cases they referred to. In our cases the latent intervals were five days, two months and four weeks respectively. It is questionable whether the hydrocephalus *per se* is a factor.

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CONSTITUTIONAL DIFFERENCES BETWEEN DETERIORATED AND NON-DETERIORATED PATIENTS WITH EPILEPSY.

II. Anthropometric Measurements.*

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In previous communications [1, 2, 3, 4, 5, 6] we have indicated that descriptions of epilepsy in the literature do not deal with the broader aspects of the disease, but only with those encountered in institutional practice. This circumstance prevails because the literature on epilepsy has been evolved by workers in institutions or colonies who had access only to committed patients. The numberless patients with epilepsy who do not develop mental changes and whose achievements in the outside world parallel those of their non-epileptic fellows did not come within the ken of the classical institutional writers. It is, therefore, easy to see why these workers believed that deterioration is inevitable in almost all patients with epilepsy, and why this conception has become so firmly implanted in the literature and in the minds of those who reflect upon this disease.

The conception that practically all patients with epilepsy deteriorate can easily be challeneged by studies of extramural patients. In such a study one of us (H. A. P.[1]) reported that of 304 epileptic persons who had had the disease over six years, and in some instances for decades, only 6.5 per cent deteriorated; the remainder adjusted in the outside world on the same plane as their fellowmen. Further study of the non-deteriorated patients showed that they presented certain essential differences from the deteriorated ones. They came of a stock with a lighter load of neuropathy,[1, 2] the onset was later,[1, 3] they had fewer seizures [1, 4] and more and longer remissions.[1] In another study [5] we pointed out that epilepsy is less frequent in the offspring of non-deteriorated epileptic persons than in that of deteriorated ones. In

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another communication [6] we described a constitutional difference between the two groups; namely, that anatomic developmental anomalies, *i. e.*, "stigmas of degeneracy," are much more common in institutional deteriorated patients than in non-deteriorated ones, and it was suggested that this heavier stigmatization may be correlated with greater incidence of congenital cerebral anomalies.

It seems reasonable to us that there may be other constitutional differences in the two groups and the present study is an attempt to determine whether the institutional deteriorated patients possess differences in body habitus from that of well-adjusted patients of the outside world.

That there may be a relation between body habitus and physical disease, mental disorder or mental traits is a notion as old as antiquity. Dissertations on this question may be found in the works of Aristotle, Hippocrates, Galen and the ancient Hindoos. Modern attempts to associate body habitus with mental disease began with Esquirol.[7] He stated that those patients who are strong and robust are prone to acute psychoses with definite crises, while others are more susceptible to chronic mental diseases with dementia. Since the time of Esquirol this subject has been discussed by many writers. In the literature we have been able to find 31 classifications [8, 9] of human habitus by as many writers; the most recent one and the one most discussed at present being that of Kretschmer.[10] He distinguished four types of habitus, pyknic, asthenic, athletic and dysplastic, and described the physical characteristics of each. Further, he stated that the pyknic habitus was associated with manic-depressive psychosis, and that there was an association between schizophrenia and the asthenic, athletic and dysplastic types.

The incidence of these body types in epilepsy has been studied by Dellbrück,[11] Hofmann,[12] von Rhoden,[13] Gründler,[14] Mauz,[15] Katona,[16] Graf,[17] Kreyenberg,[18] Schönfeld,[19] Schretzmann [20] and Weise.[21] The results of these studies are summarized in Table I. A study of this table shows that there are enormous differences of opinion as to the incidence of the various body types in epilepsy. Thus, in males the asthenic type is said to occur in from 11.6 per cent to 32.4 per cent and in females from 11.76 per cent to 54.5 per cent. The incidence of the pyknic type is stated as varying from 0.0 per cent to 66.6 per cent in males and from 0.0 per cent to

58.8 per cent in females. The occurrence of the athletic type is said to vary from 0.0 per cent to 65.0 per cent in males and from 0.0 per cent to 33.3 per cent in females while that of the dysplastic type is said to vary from 8.2 per cent to 50.0 per cent in males and from 17.65 per cent to 43.6 per cent in females. Dellbrück, Kreyenberg and Weise were able to assign a body type to every patient studied; others were unable to assign a definite habitus in from 3.33 per cent to 34.5 per cent of patients studied.

Such striking differences as those described above force one to seek an explanation. Since physical configuration might differ

TABLE I

PERCENTAGE DISTRIBUTION OF THE VARIOUS BODY TYPES IN EPILEPSY GIVEN BY VARIOUS AUTHORS

Writer	Number of Patients	Asthenic %	Athletic %	Asthenic-Athletic %	Pyknic and mixed forms %	Dysplastic %	Mixed, unclassified or atypical forms %
Dellbrück[11]	60 males	28.3	40.0	8.3	6.7	16.7	0.0
	15 females	26.7	33.3	0.0	20.0	20.0	
Hofmann[12]	40 (Sex unstated)	15.0	20.0	17.5	20.0	5.0	22.5
v. Rhoden[13]	52 males	17.3	34.6	-	0.0	13.5	34.5
Gründler[14]	47 males	29.7	21.3	17.0	6.4	21.3	4.3
	33 females	54.5	0.0	0.0	27.3	18.2	0.0
Mauz[15]	81 males	-	-	-	-	50.0	
Katona[16]	34 males	23.5	11.8	-	17.6	47.1	
Graf[17]	50 (Sex unstated)	12.0	4.0	2.0	20.0	36.0	26.0
Kreyenberg[18]	337 males	11.6	32.1	9.5	2.9	43.9	0.0
	149 females	17.4	30.8	8.1	0.0	43.6	0.0
Schonfeld[19]	30 males	16.67	0.00	-	66.67	13.33	3.33
	17 females	11.76	0.00	-	58.82	17.65	11.76
Schretzmann[20]	37 males	32.4	5.4	-	24.3	8.2	29.7
Weise[21]	20 males	25.0	65.0	-	0.0	10.0	-

in different races, the question might arise as to whether the differences reported may be due to differences in race. Unfortunately, the authors cited made no mention of the racial origin of their experimental subjects, but it appears that practically all of the above writers studied persons of the Teutonic races, so it seems that differences in race alone cannot account for such enormous variations. Furthermore, Roesler [22] and Henckel [23] concluded that racial origin in the Central European peoples they studied is not an important factor in the recognition of body types. Since the authors cited above came to their conclusions by subjective appraisal of body type and not by the use of objective criteria one

is forced to conclude that the differences described above must be due in large measure to the "personal equation" of the observer, and that the subjective estimation of body habitus leaves a great deal to be desired as a valid experimental approach.

It was considerations such as the above that led Sioli and Meyer [24] to state that the more they study patients from the standpoint of Kretschmer's method the more they see that it is inadequate from the anthropometric point of view because the method is an intuitive one. Koranyi [25] also deplored the poverty of objective critereria in the study of body types. Wuth [26] stated that men cannot be divided into types, and that the most reliable information about habitus should come from objective measurement which combats the uncertainty of subjective estimation. Others in agreement with these views have attempted to develop mathematical formulæ as an aid in the objective determination of body type; such equations have been advanced by Zielinski,[27] Wertheimer and Hesketh,[8] Andreew,[28] Klineberg, Asch and Block,[29] Westphal and Strausz,[30] Westphal,[31] Wigert,[32] Kühnel,[33] Plattner,[34, 35] Dimitrijevic.[36] However, even these mathematical formulæ do not eradicate subjective factors, because they have been derived from patients selected subjectively as representative of a certain "type," and each of these writers accepted his formula as valid if correlations were found between his calculations and a "type" previously selected by inspection and palpation. It appears to us that bestowing an arithmetical blessing upon a previous and probably precarious subjective venture advances but little the cause of objectivity in the determination of body types.

From a review of the literature and from our experiences with the study of patients we find ourselves forced to conclude that at present the satisfactory recognition of body types is hopelessly confounded by lack of objective methods. Here, as elsewhere, man classifies; nature does not: man can with some assurance recognize an archetype; nature produces subtle transition forms that result in physical configurations that can be considered a certain "type" only with the aid of personal equation and subjective straining.

It was for these reasons that we decided to abandon a consideration of types in the present study and, instead, to employ a strict anthropometric technic. Such a method, we believe, has the merit

of greater objectivity; subjective error would then be reduced to the amount unavoidable in locating an anatomical point, placing the measuring instrument and reading a centimeter scale. That such a method may be useful in determining constitutional differences is indicated by the work of von Verschuer.[37] He studied anthropometric measurements and indices in 102 pairs of identical twins and 47 pairs of fraternal twins and found a significantly greater degree of resemblance between identical twins than between fraternal twins. He concluded that constitutional or genotypic influences play a major rôle in determining body measurements and proportions.

Materials and Methods.

The subjects utilized for the present study consisted of 50 epileptic patients with deterioration in the Chicago, Elgin and Dixon State Hospitals, and 39 patients with no deterioration from the outpatient clinics of Northwestern University Medical School, Evanston Hospital, Michael Reese Hospital and the Central Free Dispensary of Rush Medical College. All were male; the ages of the deteriorated patients varied from 19 to 45 years; those of the other group from 19 to 46 years. In both groups most of the patients were from 20 to 40 years of age. In order to allow time for deterioration to occur no patient was accepted for the group of those not showing deterioration unless he had had seizures for at least four years; many of these patients had had seizures for decades. In both groups we were careful to exclude persons with defective mental development; in some instances this was done with the aid of psychometric tests; in others by a study of the educational and vocational experience of the patient. No patient was accepted who had signs of focal neurologic disorder. The subjects were mainly of central, eastern and southern European stock, and in order to obviate differences due to ethnic origin we selected our material so that racial representation would be the same in both groups.

After studying the literature we decided to adopt the anthropometric technics of Martin,[38] Saller,[39] and Draper,[40] as we believe that these possess the greatest objectivity. We found it necessary to discard a few measurements of these writers because of difficulty in locating certain anatomical points on a living subject. The measurements taken are illustrated in Figs. 1 and 2. All

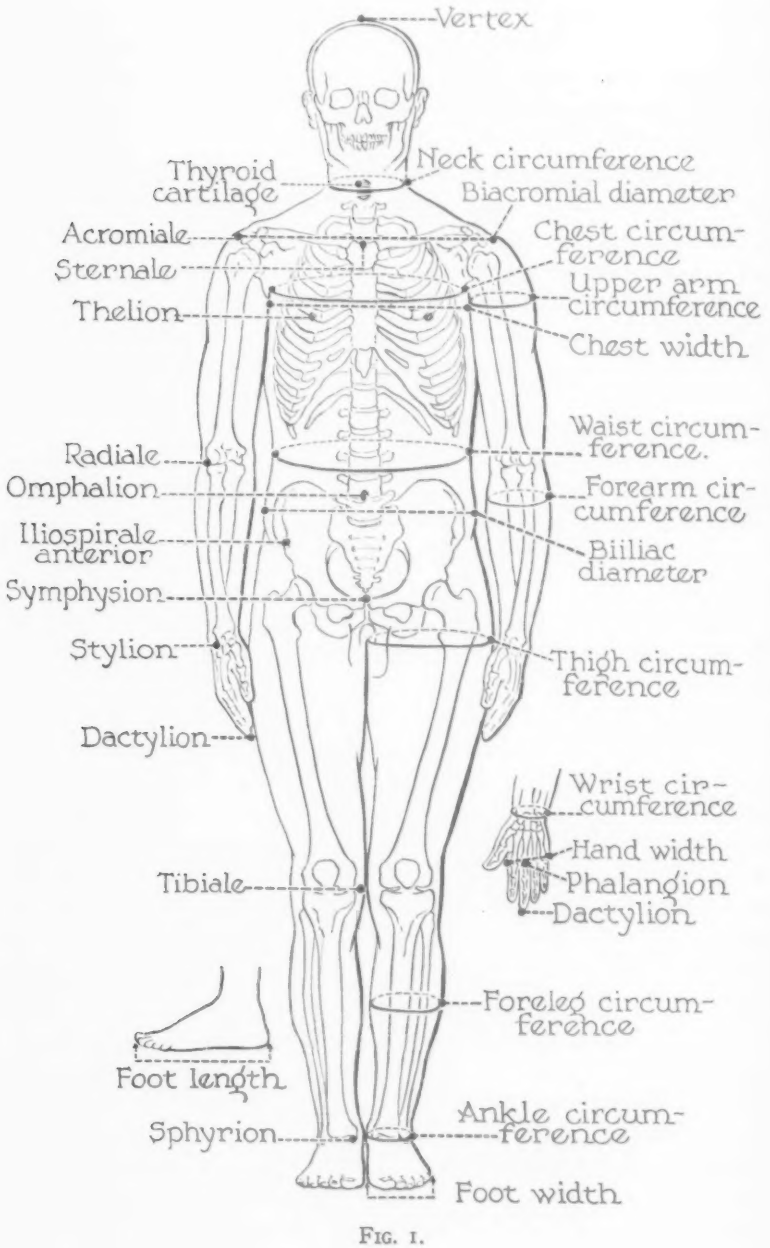
Vertex
Thyroid cartilage
Neck circumference
Biacromial diameter
Acromiale
Sternale
Thelion
Chest circumference
Upper arm circumference
Chest width
Waist circumference.
Radiale
Omphalion
Forearm circumference
Iliospirale anterior
Biiliac diameter
Symphysion
Stylion
Thigh circumference
Dactylion
Wrist circumference
Hand width
Phalangion
Dactylion
Tibiale
Foreleg circumference
Foot length
Sphyrion
Ankle circumference
Foot width

FIG. 1.

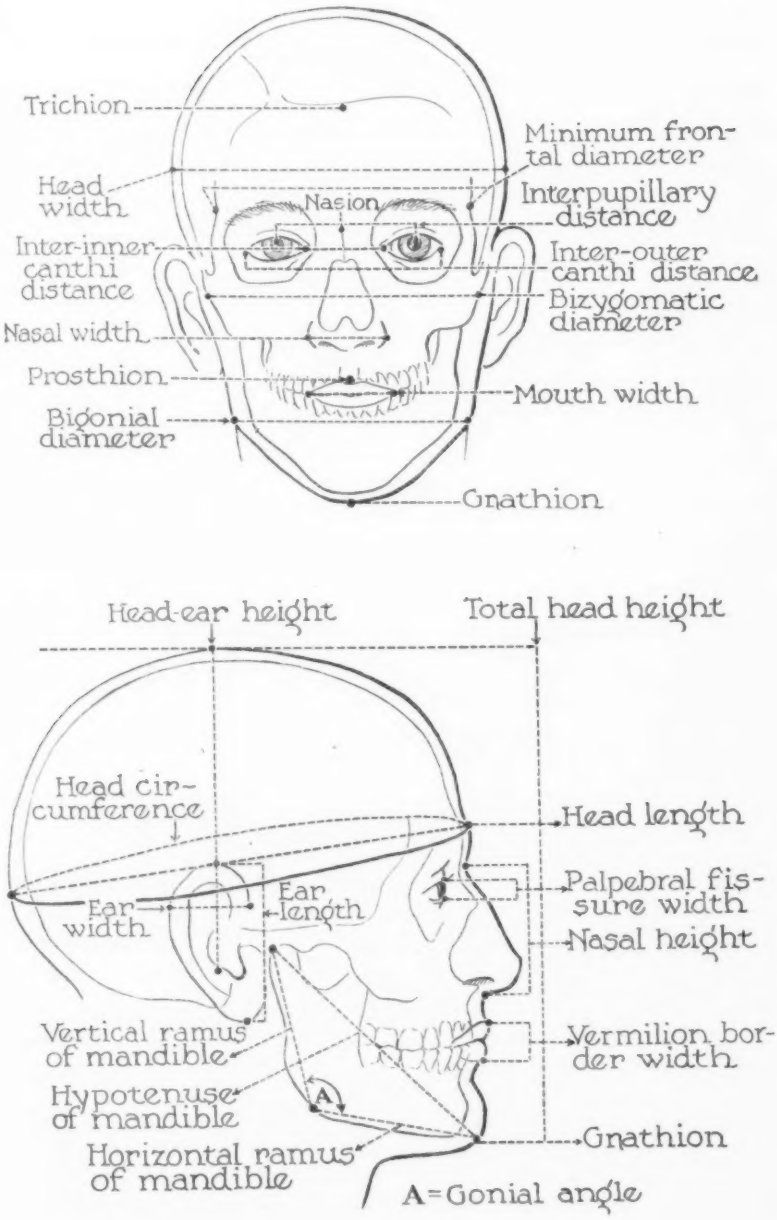
Trichion
Minimum frontal diameter
Head width
Nasion
Interpupillary distance
Inter-inner canthi distance
Inter-outer canthi distance
Bizygomatic diameter
Nasal width
Prosthion
Mouth width
Bigonial diameter
Gnathion
Head-ear height
Total head height
Head circumference
Head length
Palpebral fissure width
Ear width
Ear length
Nasal height
Vertical ramus of mandible
Vermilion border width
Hypotenuse of mandible
A
Gnathion
Horizontal ramus of mandible
A=Gonial angle

FIG. 2.

TABLE II

ANTHROPOMETRIC MEASUREMENTS IN 50 DETERIORATED AND 30 NON-DETERIORATED PATIENTS WITH EPILEPSY

Measurement	Mean Value: Deteriorated Patients	Mean Value: Non-deteriorated Patients	Standard Deviation: Deteriorated Patients	Standard Deviation: Non-deteriorated Patients	Mean det. minus Mean non-det.	Critical Ratio of Difference in Means
BODY						
Weight	69.3 kilo.	64.1 kilo.	10.3 kilo.	8.88 kilo.	5.2 kilo.	2.55
Height	170.7 cm.	169.4 cm.	6.42 cm.	4.49 cm.	1.3 cm.	1.39
Body surface*	1.81 sq.m.	1.74sq.m.	.144sq.m.	.137sq.m.	.07sq.m.	2.34
TRUNK						
Sternale	139.5 cm.	138.3 cm.	5.83cm.	5.65 cm.	1.2 cm.	.960
Thelion	124.8 "	123.2 "	6.00 "	5.80 "	1.6 "	1.28
Omphalion	101.1 "	99.3 "	5.68 "	5.73 "	1.8 "	1.50
Sitting height	89.7 "	89.8 "	3.18 "	3.29 "	-.1 "	.144
Symphysion	87.0 "	85.1 "	4.75 "	5.00 "	1.9 "	1.84
Height minus sitting height	81.1 "	79.6 "	4.67 "	4.91 "	1.5 "	1.47
Sternale-symphysion distance	52.5 "	53.2 "	2.68 "	2.58 "	-.7 "	1.25
Biacromial diameter	38.9 "	39.3 "	1.80 "	1.96 "	-.4 "	.970
Biiliac diameter	28.7 "	27.0 "	2.19 "	1.42 "	1.7 "	4.43
Chest width	28.2 "	27.3 "	2.04 "	1.69 "	.9 "	2.26
Chest depth	20.8 "	19.7 "	1.91 "	1.77 "	1.1 "	2.87
Chest circumference (inspiration)	95.1 "	92.4 "	6.70 "	4.98 "	2.7 "	2.18
Chest circumference (expiration)	90.5 "	87.7 "	6.67 "	5.80 "	2.8 "	2.17
Chest excursion	4.8 "	4.6 "	1.8 "	1.7 "	.2 "	.54
Waist circumference	80.8 "	75.8 "	7.57 "	6.80 "	5.0 "	3.29
Neck circumference	36.6 "	36.1 "	1.98 "	1.90 "	1.5 "	3.62
UPPER EXTREMITY						
Acromiale	139.8 "	137.7 "	5.78 "	6.80 "	2.1 "	1.55
Radiale	106.6 "	105.0 "	4.61 "	4.75 "	1.6 "	1.59
Stylion	82.0 "	80.6 "	3.89 "	3.64 "	1.4 "	1.75
Dactylion	63.1 cm.	62.2 cm.	3.61 cm.	3.64 cm.	.9 cm.	1.16
Span	178.1 "	176.4 "	8.67 "	8.77 "	1.7 "	.905
Upper arm circumference	30.3 "	28.7 "	3.07 "	2.50 "	1.6 "	2.06
Forearm circumference	26.0 "	25.6 "	1.98 "	1.81 "	.4 "	.992
Wrist circumference	16.8 "	16.5 "	.957 "	.852 "	.3 "	1.56
Hand width	8.4 "	8.4 "	.546 "	.424 "	0.0 "	0.0
Acromiale-dactylion (arm length)	76.1 "	75.5 "	4.25 "	4.32 "	.6 "	.654
Acromiale-radiale (upper arm length)	33.2 "	32.7 "	2.12 "	2.98 "	.5 "	.886
Radiale-stylion (forearm length)	24.6 "	24.3 "	1.61 "	1.79 "	.3 "	.820
Stylion-dactylion (hand length)	18.9 "	18.4 "	2.00 "	1.27 "	.5 "	1.43
Phalangion-dactylion (middle finger length)	10.5 "	10.4 "	.639 "	.559 "	.1 "	.778
LOWER EXTREMITY						
Iliospinale anterior	96.2 "	95.4 "	5.17 "	6.07 "	.8 "	.655
Tibiale	47.0 "	46.9 "	3.61 "	3.28 "	.1 "	.136
Sphyrion	7.8 "	7.6 "	.988 "	1.30 "	.2 "	.796
Thigh circumference	53.7 "	51.6 "	5.15 "	4.19 "	2.1 "	2.11
Foreleg circumference	34.6 "	33.8 "	2.59 "	2.50 "	.8 "	1.47
Ankle circumference	25.5 cm.	24.7 cm.	1.56 cm.	1.42 cm.	.8 cm.	2.51
Leg length	92.2 cm.	91.5 "	4.72 "	4.75 "	.7 "	.637
Foot length	26.2 "	26.0 "	1.38 "	2.30 "	.2 "	.490
Foot width	10.0 "	9.8 "	.659 "	.499 "	.2 "	1.63
Iliospinale anterior-tibiale (thigh length)	45.3 "	46.7 "	3.05 "	4.55 "	-1.0 "	1.18
Tibiale-sphyrion (foreleg length)	39.1 "	39.4 "	3.53 "	3.79 "	-.3 "	.382
HEAD						
Head circumference	56.4 "	55.7 "	2.08 "	1.79 "	.7 "	1.74
Head length	19.3 "	19.1 "	.922 "	.767 "	.2 "	1.12
Head width	15.3 "	15.2 "	.676 "	.595 "	.1 "	.747
Head capacity**	1577. cc.	1459. cc.	191.5 cc.	137. cc.	118. cc.	3.34
Head-ear height(rt.)	13.9 cm.	13.8 cm.	1.14 cm.	1.16 cm.	.1 cm.	.400
Total head height	22.4 "	22.0 "	1.46 "	1.29 "	.4 "	1.26
Trichion-gnathion	19.8 "	18.3 "	1.43 "	1.02 "	.5 "	1.90
Nasion-gnathion	12.3 "	11.9 "	.765 "	.746 "	.4 "	2.49
Nasion-prosthion	7.1 "	6.9 "	.526 "	.524 "	.2 "	1.78
Nasal height	5.4 "	5.2 "	.352 "	.348 "	.2 "	2.68
Nasal width	3.5 "	3.5 "	.310 "	.294 "	0.0 "	0.0
Minimum frontal diameter	11.2 "	11.3 "	.805 "	.909 "	-.1 "	.782
Bizygomatic diameter	13.9 "	13.8 "	.564 "	.562 "	.1 "	.830
Bigonial diameter	10.5 "	10.6 "	.680 "	.653 "	-.1 "	.643

TABLE II (Continued)

ANTHROPOMETRIC MEASUREMENTS IN 50 DETERIORATED AND 39 NON-DETERIORATED PATIENTS WITH EPILEPSY

Measurement	Mean Value: Deteriorated Patients	Mean Value: Non-deteriorated Patients	Standard Deviation: Deteriorated Patients	Standard Deviation: Non-deteriorated Patients	Mean det. minus Mean non-det.	Critical Ratio of Difference in Means
			HEAD			
Horizontal ramus mandible (rt.)	9.4 cm.	9.4 cm.	.621 cm.	.531 cm.	0.0 cm.	0.0
Horizontal ramus mandible (lft.)	9.4 "	9.3 "	.636 "	.564 "	.1 "	.784
Verticle ramus mandible (rt.)	6.5 "	6.4 "	.747 "	.571 "	.1 "	.714
Verticle ramus mandible (lft.)	6.3 "	6.1 "	.681 "	.736 "	.2 "	1.31
Hypotenuse of mandible (rt.)	13.2 "	13.0 "	1.12 "	.708 "	.2 "	1.03
Hypotenuse of mandible (lft.)	13.0 "	12.7 "	.796 "	.845 "	.3 "	1.70
Gonial angle*** (rt.)	112°	109°	14.1°	9.95°	3.0°	1.17
Gonial angle*** (lft.)	112°	110°	11.8°	8.13°	2.0°	.946
Ear length (rt.)	6.6 cm.	6.4 cm.	.431 cm.	.377 cm.	.2 cm.	2.33
Ear length (lft.)	6.6 "	6.4 "	.478 "	.350 "	.2 "	2.27
Ear width (rt.)	3.7 "	3.6 "	.354 "	.312 "	.1 "	1.42
Ear width (lft.)	3.6 "	3.5 "	.339 "	.324 "	.1 "	1.40
Ear area**** (rt.)	2460.sq.mm.	2290.sq.mm.	341.sq.mm.	238. sq.mm.	170.sq.mm.	2.76
Ear area**** (lft.)	2403 " "	2226 " "	314 " "	222 " "	177 " "	3.22
Interpupillary distance	6.3 cm.	6.3 cm.	.418 cm.	.421 cm.	0.0 cm.	0.0
Inter-inner canthi distance	3.2 "	3.1 "	.253 "	.319 "	.1 "	1.60
Inter-outer canthi distance	9.3 "	9.1 "	.485 "	.456 "	.2 "	1.99
Palpebral fissure width (rt.)	1.0 cm.	1.0 cm.	.167 cm.	.199 cm.	0.0 cm.	0.0
Palpebral fissure width (lft.)	1.0 "	.9 "	.170 "	.209 "	.1 "	2.41
Average length of palpebral fissures	3.0 "	3.0 "	.195 "	.165 "	0.0 "	0.0
Mouth width	5.1 "	5.0 "	.453 "	.356 "	.1 "	1.17
Vermillion border width	1.4 "	1.3 "	.433 "	.439 "	.1 "	1.07

* Body surface was calculated by the DuBois formula (weight$^{.425}$·height$^{.725}$·71.84).

** Head capacity was calculated by the Lee-Pearson formula (.000337·(head length-11mm.)·(head width-11 mm.)·(head ear height-11 mm.) + 406.01 cc.).

*** Gonial angle was calculated by the trigonometric formula ($\sin A/2 = \sqrt{(s-b)(s-c)/bc}$) with the vertical and horizontal rami of the mandible as b and c and the hypotenuse as A.

**** Ear area was obtained by multiplying ear length by ear width to obtain an index to this measurement.

vertical measurements on trunk and extremities were taken from the designated point to the floor. In the trunk and extremities the following additional measurements were recorded: span, sitting height and chest depth. The weight of the subject was recorded in all instances. The instruments used were the anthropometer, tasterzirkel, gleitzirkel, stangenzirkel and bandmasz described by Martin and Saller. All but the bandmasz were made in the laboratory of Dr. T. Wingate Todd of the Western Reserve University, Cleveland.

Results of Experiments.

The results of the measurements are shown in Table II. A study of this table shows interesting differences between deteriorated and non-deteriorated patients with epilepsy. In the great

majority of instances the measurements (mean values are referred to) of the deteriorated patients are greater than those of the non-deteriorated ones. For example, measurements of the entire body and trunk, body weight, body surface, biiliac diameter, chest width, chest depth, chest circumference (on inspiration and expiration), waist circumference and neck circumference show statistically significant differences * in the two groups, those of the deteriorated patients being distinctly larger. In this group of 19 measurements only the sitting height, sternale-symphysion distance and biacromial diameter are greater in the non-deteriorated patients; statistically, however, the differences are insignificant. The remaining measurements are all larger in the deteriorated patients and although the differences in the two groups individually do not satisfy criteria for statistical importance it is believed that the consistency of trend which they show is noteworthy.

In measurements of the upper extremities the deteriorated patients invariably yield values that are greater than in those without deterioration, except in the case of hand width, the averages of which are equal in both groups. Here again, the consistency of trend is more apparent than statistically significant differences in individual measurements. The arm circumference in the deteriorated group is however, significantly greater than in the non-deteriorated patients.

In the lower extremities all measurements are greater in the deteriorated patients with the exception of thigh length and foreleg length (ilio-spinale anterior-tibiale and tibiale-sphyrion measurements), which show statistically insignificant differences. Significant differences are present in thigh circumference and ankle circumference.

In the majority of measurements about the head the deteriorated patients have larger values than those without deterioration. Such differences are found to be statistically significant in head

* In accordance with the opinion of Fisher (Fisher, R. A.: Statistical Methods for Research Workers, London, Oliver and Boyd, 1928, p. 45) a difference is regarded as statistically significant in this study if the critical ratio for that difference and its standard error is 2.00 or more. A critical ratio of 2.00 indicates that such an observed difference would be noted in 95.4 per cent of repetitions of a similar experiment.

capacity, nasion-gnathion, nasal height, ear length (right and left), ear area (right and left) and palpebral fissure (left). In the remaining measurements reversal of this relationship occurs in minimum frontal diameter and bigonial diameter and can be seen to be insignificant statistically. A consistency of trend toward larger measurements in the deteriorated patients is apparent in this group of measurements also.

In summarising the above findings it may be stated that in 73 measurements the deteriorated patients have larger values than the non-deteriorated ones and in 20 of these the observed differences in the means are statistically significant. In the seven measurements where the non-deteriorated patients have larger values the differences are all unimportant statistically.

The above data deal with absolute measurements; there are recorded in the literature several indices intended to show the relation in size between a given part and others. Several indices from the literature have been collected and calculated for our patients. The indices most commonly used are: Quetelet-Bouchard (weight/height), Gould-Kaupp (weight/height^2), Rohrer (weight/height^3), Pignet (height-(weight + chest circumference)), Pignet-Verwaeck ((weight + chest circumference)/height), Pignet-Pelidisc ($\sqrt[3]{10 \cdot \text{weight}}$/sitting height), Wertheimer-Hesketh (leg length $\cdot 10^5$/chest width $\cdot$ chest depth $\cdot$ sternale-symphysion), Marburg B (height $\cdot$ 100/biacromial diameter $\cdot$ chest width $\cdot$ chest depth $\cdot$ sternale-symphysion), Stockholm$_2$ modif. (leg length^2/chest width $\cdot$ chest depth), Andreew ((chest circumference + waist circumference)-(arm length + leg length) $\cdot$ 100/chest width $\cdot$ chest depth), Rheinau B (biacromial diameter $\cdot$ chest width/symphysion), trunk width index (biiliac diameter + biacromial diameter/2 $\cdot$ height), frontoparietal index (minimum frontal diameter $\cdot$ 100/head width) and nasal index (nasal width $\cdot$ 100/nasal height). The other indices calculated involve only two parts; these indices consist of the first measurement divided by the second and expressed in terms of per cent.

In Table III is shown how the mean values of these indices compare in the deteriorated and non-deteriorated patients. A study of this table shows some interesting differences in the two groups. Of the 57 indices, 24 show significant differences in the two groups. Seventeen of these are significantly greater in the deteriorated

TABLE III

ANTHROPOMETRIC INDICES IN 50 DETERIORATED AND 39 NON-DETERIORATED PATIENTS WITH EPILEPSY

Index	Mean Value: Deteriorated Patients	Mean Value: Non-deteriorated Patients	Standard Deviation: Deteriorated Patients	Standard Deviation: Non-deteriorated Patients	Mean diff.: minus Mean: non-det.	Critical Ratio of Difference in Means
INDICES DERIVED FROM TRUNK OR ENTIRE BODY MEASUREMENTS						
Height/weight	2.52	2.68	.332	.332	-.16	2.25
Quetelet-Bouchard	40.5	37.8	5.49	4.69	2.7	2.50
Gould-Kaupp	23.7	22.3	3.11	2.66	1.4	2.29
Rohrer	1.39	1.32	.199	.172	.07	1.96
Pignet-Verwaeck	93.0	91.1	9.30	7.26	1.9	1.08
Pignet	8.99	15.0	13.3	11.6	-6.01	2.28
Pignet-Delidiac	.999	.958	.0618	.0438	.051	2.77
Wertheimer-Hesketh	30.7	31.6	4.00	4.64	-.9	.964
Marburg B	148.	158.	26.2	26.4	-10.0	1.78
Stockholm$_2$ modif.	14.8	15.8	1.85	2.13	-1.0	2.51
Andreew	8.97	-4.23	20.3	21.0	10.2	2.30
Rheinau B	1.26	1.20	.133	.123	.06	2.21
Surface/weight	2.63	2.74	.199	.184	-.11	2.78
Sternale-symphysion/ height	30.5	31.4	1.37	1.37	-.9	3.07
Sternale-symphysion/ waist circumference	65.5	70.6	6.78	6.44	-5.1	2.76
Sternale-syaphysion/ span	29.5	30.2	1.78	1.66	-.7	1.90
Sitting height/height	52.5	53.1	1.39	1.45	-.6	1.97
Chest circumference/ height	54.3	53.2	3.79	3.21	1.1	1.49
Chest circumference/ sternale-symphysion	1.77	1.70	.140	.104	.07	2.72
Height/chest width	6.09	6.21	.413	.364	-.12	1.48
Chest depth/chest width	73.9	72.2	6.72	6.25	1.7	1.23
Biacromial diameter/ height	22.3	22.6	1.04	1.06	.2	.390
Biacromial diameter/ chest circumference	42.0	41.4	2.56	2.41	.6	1.13
Biacromial diameter/ sternale-symphysion	74.4	72.1	4.87	4.30	2.3	2.44
Biiliac diameter/ height	16.8	16.0	1.07	.755	.8	4.13
Trunk width index	19.8	19.3	.867	.737	.5	2.95
Biiliac diameter/ biacromial diameter	73.8	70.6	4.63	3.75	3.2	3.80
Biiliac diameter/ sternale-symphysion	54.9	51.0	4.52	3.59	3.9	4.59
Biiliac diamete / chest width	100.	99.4	6.46	6.11	.6	.448
Waist circumference/ height	47.4	44.9	4.51	4.34	2.6	2.76
INDICES DERIVED FROM MEASUREMENTS OF UPPER EXTREMITY						
Acromiale/height	81.9	81.2	1.12	1.37	.7	2.88
Acromiale-dactylion (arm length)/height	44.9	44.6	1.37	1.38	.4	1.28
Acromiale-dactylion (arm length/leg length	83.1	82.4	2.82	2.85	.7	1.15
Span/height	1.04	1.04	.0298	.0284	0.0	0.0
Acromiale-dactylion (arm length)/sternale-symphysion	1.43	1.42	.102	.0910	.06	3.10
INDICES DERIVED FROM MEASUREMENTS OF LOWER EXTREMITY						
Leg length/height	54.1	54.0	1.38	1.46	.1	.330
Leg length/sternale-symphysion	1.77	1.73	.110	.109	.04	1.71
Leg length/biiliac diameter	3.24	3.38	.203	.159	-.14	3.65
INDICES DERIVED FROM MEASUREMENTS OF HEAD						
Cephalic index	79.1	79.7	4.80	4.63	-.6	.596
Head height/height	13.1	13.0	.331	.720	.1	.607
Head width/head height	68.6	69.3	4.41	4.20	-.7	.763
Head ear height/ head height	61.8	63.0	5.18	5.54	-1.2	1.03
Fronto-parietal index	72.9	74.5	5.02	4.02	-1.6	1.67
Trichion-gnathion/ bizygomatic diameter	1.35	1.33	.113	.0748	.02	.970
Nasion-gnathion/ bizygomatic diameter	88.2	86.5	5.71	3.94	1.7	1.66
Nasion-gnathion/ head height	55.2	54.3	3.32	3.10	.9	1.32
Nasion-prosthion/ bizygomatic diameter	51.2	49.6	3.76	3.47	1.6	2.11
Ear index (rt.)	56.7	56.5	5.16	6.24	.2	.162
Ear index (lft.)	54.8	54.9	6.81	6.42	-.1	.0739
Ear area/head length x head width (rt.)	5.91	5.48	.976	.674	.33	1.89
Ear area/head length x head width (lft.)	5.71	5.36	.975	.644	.35	2.04
Nasal index	67.6	67.2	7.29	6.29	.4	.277
Interpupillary distance/nasion-prosthion	88.9	92.1	9.80	7.18	-3.3	1.80
Interpupillary distance/bizygomatic diameter	45.1	45.5	3.58	2.42	-.4	.614
Bizygomatic diameter/ bigonial diameter	1.33	1.31	.0771	.0680	.02	1.30
Bizygomatic diameter/ minimum frontal diameter	1.25	1.22	.0635	.0576	.03	2.32
Inter inner canthi distance/inter outer canthi distance	34.3	34.4	1.40	2.62	-.1	.216

patients, as follows: Quetelet-Bouchard, Gould-Kaupp, Pignet-Palidisc, Andreew, Rheinau B, chest circumference to sternale-symphysion, biacromial diameter to sternale-symphysion, biiliac diameter to height, trunk width index, biiliac diameter to biacromial diameter, biiliac diameter to sternale-symphysion, waist circumference to height, acromiale to height, arm length (acromiale-dactylion) to sternale-symphysion, nasion-prosthion to bizygomatic diameter, ear area to head length · head height (on left) and bizygomatic diameter to minimum frontal diameter. The following indices are significantly greater in the non-deteriorated patients: height to weight, Pignet, Stockholm$_2$ modif., body surface to weight, sternale-symphysion to height, sternale-symphysion to waist circumference, leg length to biiliac diameter.

Further analysis of these indices brings out three points which are considered significant. All indices relating weight to height indicate that the deteriorated patients are heavier per unit of height than the non-deteriorated patients. The indices relating transverse to longitudinal measurements of the trunk are greater in the deteriorated patients than in the non-deteriorated ones; indicating that the trunks of the deteriorated patients are wider and deeper per unit of height than are those of the non-deteriorated patients. Although all indices relating to this point do not show statistically significant differences it is believed that enough of them do and do so to a sufficient degree to make the generalization valid. This is further borne out by the absence of differences which are contradictory to this trend. In the face such relationships are reversed. The indices of the face relating a longitudinal to a transverse measurement are greater in the deteriorated patients, indicating that the deteriorated patients have narrower faces per unit of face height than the non-deteriorated patients. Only one of the three indices (trichion-gnathion to bizygomatic diameter, nasion-gnathion to bizygomatic diameter and nasion-prosthion to bizygomatic diameter) relating to this point shows a significant difference but the trend shown by the combination of indices may be regarded as significant, since the mean deviations for the three indices in a standard score show significant differences between the two groups of patients.

An attempt was next made to determine the relative incidence of unusually small or unusually large measurements and indices

in the two groups of patients. The value of a measurement or index is regarded here as unusually large or unusually small if it lies outside of a range the lower limit of which is halfway between mean and minimum and the upper limit halfway between mean and maximum for that particular measurement or index. The mean, minimum and maximum here are for the entire group of 89 patients. The incidence of unusually high or unusually low values in the deteriorated and non-deteriorated patients is shown in Table IV. A study of this table shows that in 49 measurements and indices involving the trunk or entire body the non-deteriorated patients show a greater incidence of unusual values in 32 instances while the deteriorated patients showed this in 15 instances. In two indices (chest circumference to sternale-symphysion and Pignet-Verwaeck) both groups show the same incidence of unusual values.

Of 55 measurements and indices involving the head, the deteriorated patients show a greater incidence of unusual values in 40, the non-deteriorated in 13. In two measurements (left ear length and right ear width) the prevalence of unusual values was equal in the two groups.

In the extremities, exclusive of the feet and hands, both groups show an almost equal incidence of unusually low or high values. In the hands and feet, however, all measurements (hand length, hand width, middle finger length, foot length and foot width), show a much greater number of unusual values in the deteriorated patients. Further analysis of these data shows that trunk and entire body measurements and indices of unusual size (large or small) occur more frequently in the non-deteriorated patients, while values of unusual size in head measurements and indices are found more often in the deteriorated patients.

Summary and Conclusions

An anthropometric study was made of 50 deteriorated and 39 non-deteriorated epileptic patients to determine whether differences in body habitus exist between these two groups. Eighty measurements were recorded for each patient according to the technique described by Martin, Saller, and Draper; in addition 57 indices were calculated for each patient to show the relation

TABLE IV

THE INCIDENCE OF UNUSUALLY LARGE OR UNUSUALLY SMALL MEASUREMENTS AND INDICES IN 50 DETERIORATED AND 39 NON-DETERIORATED PATIENTS WITH EPILEPSY

Measurement or Index	Percentage of Patients with Unusually Large or Unusually Small Measurements or Indices: Deteriorated patients	Non-deteriorated patients
ENTIRE BODY OR TRUNK ALONE		
Weight	20	33
Height	18	20
Body surface	20	31
Sternale	18	20
Thelion	14	28
Omphalion	18	25
Symphysion	16	15
Sitting height	26	38
Height minus sitting height	14	28
Sternale-symphysion distance	18	26
Biacromial diameter	14	18
Biiliac diameter	22	20
Chest width	28	26
Chest depth	22	26
Chest circumference (inspiration)	26	13
Chest circumference (expiration)	22	18
Chest excursion	18	15
Waist circumference	14	28
Neck circumference	18	26
Height to weight index	24	26
Quetelet-Bouchard index	22	31
Gould Kaupp "	20	31
Rohrer "	16	23
Pignet "	52	56
Pignet-Verwaeck "	20	20
Pignet-Pelidisc "	20	18
Wertheimer-Hesketh "	22	31
Marburg B "	26	20
Stockholm$_2$ modif. "	18	26
Andreew "	16	20
Rheinau B "	26	23
Surface to weight "	22	26
Sternale-symphysion to height "	12	26
Sternale-symphysion to waist circumference "	20	33
Sternale-symphysion to span "	14	21
Sitting height to height index	16	26

TABLE IV (Continued)

Measurement or Index	Percentage of Patients with Unusually Large or Unusually Small Measurements or Indices: Deteriorated patients	Non-deteriorated patients
ENTIRE BODY OR TRUNK ALONE		
Chest circumference to height index	20	18
Chest circumference to sternale-symphysion index	26	26
Height to chest width "	12	20
Chest depth to chest width"	18	20
Biacromial diameter to height "	16	15
Biacromial diameter to chest circumference "	22	18
Biacromial diameter to sternale-symphysion "	20	26
Biiliac diameter to height"	20	13
Trunk width "	8	7.7
Biiliac diameter to biacromial diameter "	18	20
Biiliac diameter to sternale-symphysion "	30	23
Biiliac diameter to chest width "	16	23
Waist circumference to height "	14	18
UPPER EXTREMITY		
Acromiale	10	15
Radiale	24	21
Stylion	28	36
Dactylion	32	32
Span	22	18
Upper arm circumference	26	13
Forearm "	16	15
Wrist "	24	18
Hand width	22	13
Acromiale-dactylion (arm length)	10	13
Acromiale-radiale (upper arm length)	16	28
Radiale-stylion (forearm length)	24	26
Stylion-dactylion (hand length)	8	0
Phalangion-dactylion (middle finger length)	23	13
Acromiale to height index	2.0	2.6
Acromiale-dactylion (arm length) to height index	14	5.1
Acromiale-dactylion (arm length) to leg length index	33	18
Span to height index	18	13
Acromiale-dactylion (arm length) to sternale-symphysion index	18	23
LOWER EXTREMITY		
Iliospinale anterior	16	23

TABLE IV (Continued)

Percentage of Patients with Unusually Large or Unusually Small Measurements or Indices

Measurement or Index	Deteriorated patients	Non-deteriorated patients
	LOWER EXTREMITY	
Tibiale	38	26
Sphyrion	18	38
Thigh circumference	22	26
Foreleg "	31	26
Ankle "	24	28
Foot length	20	13
Foot width	22	15
Leg length	8.2	10
Iliospinale anterior-tibiale (thigh length)	8.2	18
Tibiale-sphyrion (foreleg length)	31	38
Leg length to height index	18	18
Leg length to sternale-symphysion "	10	18
Leg length to biiliac diameter "	26	5.1
	HEAD	
Head circumference	28	20
Head length	18	7.7
Head width	18	15
Head capacity	28	16
Head-ear height (right)	16	14
Total head height	22	13
Trichion-gnathion	28	11
Nasion-gnathion	24	26
Nasion-prosthion	10	13
Nasal height	26	20
Nasal width	16	10
Minimum frontal diameter	8	20
Bizygomatic diameter	20	18
Bigonial diameter	26	23
Horizontal ramus of mandible (right)	24	13
Horizontal ramus of mandible (left)	30	13
Vertical ramus of mandible (right)	32	15
Vertical ramus of mandible (left)	26	23
Hypotenuse of mandible (right)	24	10
Hypotenuse of mandible (left)	10	15
Gonial angle (right)	20	15
Gonial angle (left)	14	13
Ear length (right)	14	7.7
Ear length (left)	10	10
Ear width (right)	18	18

TABLE IV (Continued)

Measurement or Index	Percentage of Patients with Unusually Large or Unusually Small Measurements or Indices: Deteriorated patients	Non-deteriorated patients
	HEAD	
Ear width (left)	30	36
Ear area (right)	20	7.7
Ear area (left)	18	13
Interpupillary distance	13	7.7
Inter-inner canthi distance	4	15
Inter-outer " "	10	15
Palpebral fissure width (right)	12	18
" " " (left)	8	21
Average length of palpebral fissures	38	23
Mouth width	8	7.7
Vermillion border width	18	13
Cephalic index	12	10
Head height to height index	22	15
Head width to head height "	30	20
Head-ear height to head height "	28	35
Fronto-parietal "	8	18
Trichion-gnathion to bizygomatic diameter "	28	19
Nasion-gnathion to bizygomatic diameter "	16	10
Nasion-gnathion to head height "	24	18
Nasion-prosthion to bizygomatic diameter index	16	10
Ear index (right)	20	28
Ear " (left)	24	23
Ear area to head length x head width (right) "	20	7.7
Ear area to head length x head width (left) "	18	13
Nasal index	18	15
Interpupillary distance to nasion-prosthion "	17	7.7
Interpupillary distance to bizygomatic diameter"	21	5.1
Bizygomatic diameter to bigonial diameter "	12	5.1
Bizygomatic diameter to minimum frontal diameter index	14	13
Inter-inner canthi to inter-outer canthi distance index	12	20

in size existing between a given part of the body and other parts. With few and unimportant exceptions it was found that the mean values for the various measurements are greater in the deteriorated patients. Significant differences also exist in the mean values of the indices calculated. All indices relating weight to height indicate that the deteriorated patients are heavier per unit of height than the non-deteriorated ones; the trunks of the deteriorated patients are wider and deeper per unit of height than are those of the non-deteriorated patients; the deteriorated patients have narrower faces per unit of face height than do the non-deteriorated ones. From at attempt to determine the relative incidence of unusually small or unusually large measurements and indices in the two groups of patients it was found that: trunk and entire body measurements and indices of exceptional size (large or small) occur more frequently in the non-deteriorated patients; whereas values of unusual size in head, hand and foot measurements and indices occur more often in the deteriorated patients.

It is concluded, therefore, that constitutional differences as they may be reflected in body size and proportions are present between deteriorated epileptic patients and non-deteriorated ones.

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THE PSYCHIATRIC PATIENT'S FAMILY.*

Problems and Management in a Treatment Hospital.

By EDWIN E. McNIEL, M. D.

In this paper I am attempting to discuss some of the many problems which arise in dealing with the families of psychiatric patients in the Payne Whitney Psychiatric Clinic of the New York Hospital. This paper will be limited to the problems arising in the in-patient service. Perhaps it would be wise at this time to make a few orienting remarks regarding the nature of this service. The Payne Whitney Clinic has 88 adult beds and carries an average census of 63 patients. Although the building and its furnishings are unusually fine a moderate endowment makes it possible to treat the selected cases on a financial basis equal to their ability to pay. These patients come from better homes and are selected on a basis of their cultural background, intellectual achievements, previous social adjustment and expected ability to mingle with the other patients in the hospital. They are also selected in terms of the type of the personality difficulty which they have, its duration and the expected outcome of the illness. In other words, the clinic is attempting to utilize its resources to the best advantage by carrying out an active treatment program on a group of cases selected with reasonably good cultural background and a type of illness which is expected to respond to the therapeutic facilities available in the clinic. Twelve full time psychiatrists devote the major portion of their time to the treatment of these patients. All of the facilities which have proven to be of benefit in the treatment of psychiatric patients are available in the clinic and are staffed by people experienced and trained to carry on the work in their departments. Most of our patients are voluntary, none are committed, a few are held for 30 days against their will under a special provision in the mental hygiene law. The usual policy is not to accept a patient for treatment for less than a period of one month. The average period of treatment in the clinic

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last year was 81 days. Sixty-five per cent of the patients were discharged to return home and the remainder were sent to other hospitals for a longer period of treatment.

I have dwelt on this description of the work in the Payne Whitney Clinic in order to give you some idea of the setting and an understanding of how it is possible for us to spend considerable time in managing the patient's family. I am quite well aware of the fact that many other hospitals and clinics must meet their psychiatric problems with somewhat different resources. However, in spite of the fact that the following remarks concern principally the Payne Whitney Clinic I believe that there are certain principles and philosophies involved which are applicable to many other psychiatric institutions.

What are some of the problems that we must meet? To begin with, we usually have a distressed family who are attempting to understand what is probably for them an entirely new situation in their family group. A son, or a daughter, the father, or the mother is manifesting symptoms of a mental illness. Probably up to now this individual has been a loving, respected and useful member of the family group. Here are evidences of the onset of one of the most dreaded of all sicknesses. Their first question may be, "Is this insanity?" It strikes fear in their hearts and baffles their ability to comprehend. They want a name for it. They want help, reassurance and the presentation of some logical plan which will adequately meet their needs. There are other families in which the patient's illness has developed in an insidious manner over a long period. Finally the symptoms have become so marked that the family cannot keep him in the home.

We have all degrees of insight and understanding in the family group. Some very intelligent people these days come to the hospital with the sick member of their family, having made a fairly accurate diagnosis and being quite willing to embark upon a plan of treatment which they understand surprisingly well, both as to its advantages and its limitations. Other people equally intelligent come to the hospital with a complete lack of insight, failure to appreciate the patient's problems and almost entirely uninformed as to the usual approaches to treatment. Certainly in the last 25 years there has been a marked increase in the popular interest in psychiatry and mental hygiene. A few worthwhile books and magazine articles

have been available to the public but unfortunately too often they have read poor articles, misleading books and a hodge-podge of psychology and psychiatry which has given them a false confidence and vocabulary without any real understanding of the problem. In the attempts to popularize medicine and take away the fears in the social group too many articles of the naively optimistic type have been read. There are people, who are otherwise well informed, coming to the hospital today who think that very involved schizophrenic, manic and paranoid patients may be completely cured in a few weeks by the "modern scientific treatments." They approach the problem of psychiatric treatment for a member of their family as though they were buying a new radio, and as though it were just a question of paying a price and the desired results are guaranteed. Sometimes they almost seem to expect an engraved certificate stating that the patient is cured and that a recurrence is impossible. The general public, even from the better homes, is still confused over terms which are commonly used and misused in newspapers and magazines. Surprisingly few people know the difference between psychology, psychiatry and psychoanalysis. We hear, "We want her psychoanalyzed. Can't this be done in three or four weeks because we want to go to Europe this summer?"

Many times when the patient's relatives have been advised to consult us regarding hospitalization for a patient, they have been unwilling to accept this recommendation wholeheartedly. Sometimes they want the patient to stay at home and have treatments by a psychiatrist. At the basis of this attitude we often find a fear of hospitals, or a failure to understand the structure and function of a modern psychiatric clinic. They have heard that all mental hospitals have bars on the windows, that there are padded cells and that patients are still placed in straitjackets and other forms of restraint. Or, that nurses and doctors are cruel to patients and that patients are used as subjects for experimentation. They always think that their relative is not as sick as the other patients in the hospital, or that the hospital will make him worse. Quite a few people still think that mental hospitals have a tendency to make the patient chronically ill and that it is best to keep the patient out of the hospital as long as possible. It is worth pointing out that hospital treatment may favorably modify or shorten the course of the illness. The idea exists that a mental illness has a course to run,

that it is just a matter of a specified time as in some of the infectious diseases. Hospital treatment may lessen the intensity and the span of the illness. In the special environment of the hospital we can relieve patients of worry of the stresses in the home environment. We can also give patients new assets and help them to utilize their old ones.

In the Payne Whitney Clinic 73 per cent of the patients were referred by a physician, either psychiatrists who had examined and sometimes treated the patient, or physicians in other branches of practice. It is our policy not to admit a patient unless some responsible friend or relative is present. The families of the other patients contact the hospital, either because of the recommendation of former patients, friends of the hospital, or the general reputation of the hospital. If the inquiry is by telephone an attempt is always made to allow the person calling to talk with a doctor. If the patient is disturbed or is in need of immediate hospital care and satisfactory information can be obtained over the phone, the family are allowed to bring the patient directly to the hospital. However, in the majority of cases, even though the family may think the case is an emergency, it has been found much more satisfactory to have one or two responsible members of the patient's family come to the clinic and make application for the patient's admission. The reason for such a procedure is to help the physician in determining whether the patient should come to the hospital and to give the relatives some understanding of the patient's problem, the nature of the hospital and the plans for treatment. An appointment usually can be made for this procedure and thus the family are saved waiting. It is customary to advise them not to bring the patient to the hospital at the time the application is made. This saves having the patient wait and possibly become upset and apprehensive regarding his admission to the hospital. It also saves the embarrassment of having a sick patient sitting in the entrance lounge or disturbing hospital visitors. At the time the application is taken certain statistical data is obtained, together with a brief family history, personal history, personality trend, and a history of the present illness. Sufficient details are obtained to determine the patient's background, his suitability for the clinic group and a general idea of his mental sickness, probable diagnosis and prognosis. The emphasis is placed on determining whether or not the facilities of the clinic are such that

they will be helpful in treating this patient, rather than saying that the patient is not suitable for the clinic. If it is necessary to decline the application the family is told why the clinic does not fit the needs of the patient and one or two other plans which will properly fill his needs are suggested, together with specific information as to how to proceed. In other words, we believe in our hospital that it is part of our service to the community to give each family a practical plan for meeting their needs in dealing with the problem presented.

When some relatives come to make application they will very early in the interview say, "The main thing we are interested in is how much will it cost? There is no use going into it if we can't afford it so if you will just tell us in the beginning it will save everybody's time." We attempt to adhere to a rigid plan of not discussing the financial side of the patient's treatment until we have completed the application. If the case is one which is unsuitable and cannot be accepted, it is not necessary to discuss financial arrangements, and when the case is rejected the family are less liable to develop the idea that the patient is rejected because of their financial circumstances. If the patient is acceptable the interviewer has by that time developed some idea of the financial abilities of the family and is in a much better position to discuss a rate which is to be determined on a basis of their financial circumstances. It is customary not to quote any set rates. However, cost rates and minimum rates for certain types of accommodations are discussed.

During the taking of this application and following it the doctor has an ample opportunity to discuss with the family many of their ideas concerning the nature of the patient's illness and to give them proper information in place of some of their misconceptions. Usually some hint as to the diagnosis and prognosis can be given but it is wise at this stage to be very conservative and to discuss the problem in rather general terms. After the application is taken one of the first points to settle is whether or not the patient actually needs hospital treatment. This is, of course, something that must be determined on the basis of the facts presented, together with the judgment, training and experience of the psychiatrist. I want to emphasize that with the taking of this application treatment of the patient and management of the family should begin. It is here that we begin to assume an attitude toward this sick patient and start to give the family understanding of the patient and his treatment in the

hospital. Then it is usually wise to describe to the family the plans for the examination of the patient and his treatment in the hospital. For example, it is very reassuring to the family to know that the patient will have complete physical examinations, a neurological examination, complete laboratory work, X-ray examinations of the teeth, an ear, nose and throat examination, eye examination, and in the case of female patients, a gynecological examination. Most families hope that the illness is caused by some physical disease and think that if this cause can be found and treated that the patient will get well. The realization that the hospital is interested in these things and that the patient will be treated for any malady found is very reassuring. In other words, emphasis is placed on our plan of studying and treating the total individual, not just his psychological problems. Most families appreciate, too, knowing that many hours will be spent with the family going over the patient's history and an attempt made to gain some understanding of the patient's emotional problems and the effect that they may have on his illness. Many people still think that psychiatric patients are kept in bed. They are happy to know that the patients are up and about the hospital and that they will not be left to sit and think about their problems, but that they will be put on a program of activities which will give them outlets for physical activity and an opportunity to develop desirable habits and new hobbies. Very often one can reduce considerably the time spent in answering questions about the nature of the hospital by taking 15 minutes to show the family a floor or two in the hospital and some of the departmental activities. The fact that you are willing to show them the hospital and that you have nothing to hide builds confidence in the family. A short visit to a busy class in the metal shop or the art studio will often accomplish more than two hours of description and argument.

Perhaps at this time it is wise to say something about the attitude of the doctor who has been taking this application and talking with the family. It is hardly necessary to say that he should be well trained in psychiatry in all of its branches, that he should have a thorough knowledge of the operation of the hospital and that he should be a reasonably well adjusted individual himself. To this distressed family he should present a keen interest in their problems, together with understanding, sympathy, and a kindness which

is real but certainly not overdone. Most families want help, not gushing sympathy. It is much better for the physician at this time to be a good listener, rather than to have an attitude of wanting to tell the family how much he knows about the patient. The family will soon lose confidence in the doctor who knows too much and is too willing to provide a quick answer. Conservatism is apt to breed confidence.

Now, if the patient has been accepted and the family is willing to undertake a program of treatment in the hospital, it is necessary to make the final plans for the patient's admission to the hospital. The family will want to know what attitude they should take in telling the patient of their decision. We feel that it is wise to be frank with the patient, to explain quietly to him that the doctors have advised hospital treatment and for the family to describe the hospital and the plan of treatment to him. It was not long ago that a patient was brought to the hospital under exactly the opposite circumstances. She was an intelligent woman with a reactive depression who would probably have listened to some advice. However, the family doctor saw fit to tell her that her husband had been seriously injured in an automobile wreck and was dying in our hospital. The doctor made a hurried trip in his car through traffic, bringing the patient to the hospital, crying and upset. She ran to the writer crying, "Where is he? Take me to him at once! Is he dead yet?" The family physician suggested taking the patient to one of the floors and then telling her that her husband was all right and waiting around the corner in his car. This the writer refused to do but sat down in a quiet reception room and told the patient the truth of the whole situation. The patient refused to enter the hospital but a few days later did go to another hospital and cooperated fully with the treatment. If this patient had been admitted to the hospital she could have justifiably felt that she had been unfairly treated. If we are to expect patients to cooperate emotionally and intelligently we must approach them frankly and openly on both these levels.

We have spent some time discussing many of the problems met in dealing with the relatives of the patient before his admission to the hospital. Now, what are some of the situations that arise after the patient has entered the hospital? Probably one of the first questions asked is, "When can we visit him?" Families vary in regard to their desires to visit the patient. In some instances when the family is

overattached to the patient they make requests to spend too much time with the patient. The wife of a recent male patient was 20 years younger than the patient. She had married much above her social level, had been criticized by his family and felt very insecure. She wanted to stay with the patient practically all the time and constantly subjected him to disturbing emotional stimulation. Quite in contrast to this is the family who are "fed up" with the patient and who do not care to visit him at all. There are, of course, other sensible families who are willing to accept the physicians' recommendations. We follow a plan of having regular visiting hours. These come three days a week and last from 2 to 5 p. m. Only two friends or relatives are allowed to see the patient at one time. At the time the patient enters the hospital the responsible relatives sign an authorization for incidental expenses and also approve a list of visitors for the patient. From this list the medical staff allow visiting as it seems best. This gives us an opportunity to discuss visiting with the relatives and also to exclude undesirable visitors who would disturb or excite the patient. We often point out to the patient's family that he became ill in the home environment where he was surrounded by his relatives and that it is unlikely that extra visiting will produce the desired effect in treating the patient. Relatives are, however, always assured that they will be promptly notified if anything unusual happens to the patient or that if it should seem wise they will be allowed to visit during some hours outside of the regular visiting hours. It is emphasized that the patients are being treated in a therapeutic situation with a regular organized program of activities and that visiting at odd hours disrupts the patient's activities and may disturb other patients. Most families are willing to accept restrictions as to visiting when they realize that the hospital is sincerely interested in one thing, that is, the treatment of the individual patient. I think that we tend to encourage visiting rather than to discourage it, or if we do, not arbitrarily. I am quite well aware of the fact that in some very good hospitals it has been thought wise to recommend that the family stay out of the therapeutic situation. We attempt to find out if certain relatives have a good effect on the patient or if others upset him. Then we advise who should visit the patient. We sometimes have a patient who is physically ill and who requires rest rather than the burden of carrying on a conversation. It is thought best to enlist the interest and

cooperation of the family by allowing them to see the patient as he passes through even the more disturbed part of his illness. Five minutes with a disturbed patient will sometimes do more to educate a doubting relative than two hours of conversation in the doctor's office. However, it is necessary to supplement this contact with the patient by an interview with the physician in which the patient's behavior is interpreted and the family reassured or warned as to the patient's prognosis. It helps the family to accept the patient's illness when they are led to realize that the patient's symptoms are a part of the natural course of the illness. It is wise to prepare the family when it is possible to anticipate that the patient may become worse for a time during his hospitalization. If the patient enters the hospital during the early part of his illness he may become more depressed or elated or the absence of the restraining elements in his usual environment may allow for a fuller expression of the symptoms of the underlying psychosis. If relatives do not understand this they may think that the hospital is making the patient worse and become upset. In the course of the patient's illness it will become apparent that some will eventually do well, whereas others will have a poor outcome. As soon as we can determine the probable prognosis we should begin to prepare the family, especially when the outlook is unfavorable. Good foresight is a valuable ally. We have found that when the patient's relatives have confidence in the hospital and the staff and when they have been given some insight into the patient's problems and the plan of treatment, that they are usually friendly, cooperative and appreciative.

During the patient's stay in the hospital it may become necessary to perform an operation or carry out unusual treatment procedures. We always try to talk with the family, telling them why the treatment should be done, what we hope to accomplish and an estimate of the cost. Many times we secure a signed authorization. We have found that when families are approached in this manner very little difficulty is experienced. However, if extra expenses are incurred without an explanation, except in emergencies, the family often feels that an injustice has been done.

The suicidal patient presents a problem in terms of managing the family. In every psychiatric hospital the problem of suicide is paramount. We are especially interested in this problem and try to take every precaution to prevent a suicide or even an attempt. As soon as

we feel that a patient is suicidal we try to have a conference with the family, telling them exactly what the problems are, assure and inform them regarding our methods, but also to tell them that we are dependent upon human personality in the last analysis and that the family must either agree to accept responsibility with us or remove the patient from the hospital. Very few families do remove the patient but later on if an attempt is made it is much easier to discuss this problem with the informed relatives than it would have been if a previous conference had not been held. We try to prevent the suicidal patient from leaving the hospital until he is well enough to go home for visits or to be discharged. There is no compromise here. If the family will not accept the hospital's recommendations they must assume entire responsibility for the patient. Sometimes many hours are spent with different members of the family, discussing the patient's total situation in regard to his suicidal trends and his need for hospital care and supervision. They are told at the beginning of the interview that they are free to remove the patient from the hospital but that it is against our recommendation. Thus, the whole argument centers around the needs of the patient. During the past two years three of all the patients who left the hospital against advice later committed suicide.

The problem of patients visiting outside the hospital is a complicated one and must be settled individually and not in terms of rules. However, some general principles help in shaping the family's attitude. As a rule we usually do not let the patients visit outside the hospital during their first month's residence, the general policy being that if they are sick enough to come to a hospital they need at least that much treatment before making outside contacts again. When the patient first starts visiting we require that they go with a member of the family until it is thought they are well enough to go alone. At this time the family is asked to sign a statement accepting responsibility for the patient's actions outside of the hospital. This, again, makes the family a responsible member of the group treating the patient.

Some families are overanxious and would telephone the doctor several times a day for information about the patient. Even in a clinic such as ours where the average case load for the individual doctor is about eight patients a greater portion of his time would be taken up by answering the telephone if we did not plan to manage

the problem. We start in by educating the family as to the expected course of the illness, attempting to point out to them that the patient's symptoms from day to day are not of as great importance as changes that may come from week to week or from month to month. In other words, we try to get the family to have an objective viewpoint toward the patient's illness and symptoms. We try to concentrate telephone calls in a noon telephone hour in which a doctor answers calls from twelve to one. We discourage the giving of detailed information at this time and try to protect the patient from too curious relatives. We advise the family to confer with the patient's doctor on visiting day or to make special appointments for this purpose. We also assure them that the chief resident and the medical director are available for conferences regarding special problems. This gives the family the feeling that the entire staff of the hospital is interested in the individual patient.

When patients enter the hospital we have a definite understanding with the family that the care and treatment of the patient is to be carried out under the direction of the hospital staff. While we are willing for the family physician or referring physician to visit the patient and offer suggestions he is not allowed to write orders. Occasionally a problem arises when the outside physician does not agree with the treatment or has suggestions to make which cannot be accepted by the hospital staff. A delicate situation may arise when the family become involved in this discussion. For instance, the outside physician may advise drugs or sedatives or some elaborate investigative procedure. Families are usually anxious to have the patient receive treatment or examination and may favor following the suggestions. It is necessary to keep oriented regarding the ethics of the situation. A good plan to pursue is that of being entirely aboveboard and frank about the matter. In other words, to assume in the beginning that physicians have a perfect right to have individual opinions regarding treatment and that the fact that they have different opinions does not necessarily mean that either one is right or wrong. It is best to tell the family that Dr. Jones feels that the patient should have such and such a treatment but that the hospital staff believes in a different type of treatment. If the family press for some action it may come to a point when it is necessary to have the family make a decision as to whether they want the patient to remain in the hospital and be treated by the hospital and its staff or

remove the patient from the hospital and have him treated by the outside physician. It is better for the family to follow the physician whose judgment and advice they trust. If properly handled this situation can be settled to the mutual satisfaction of all concerned.

In mental illness you are all familiar with the fact that there is often a difference in diagnostic opinion. Many times families, in their attempt to understand the situation, will go to different members of the staff of the hospital in order to see if they will get the same diagnosis or opinion. We attempt to confer among ourselves frequently enough to organize our thoughts and present consistent opinions to the family. At the same time this does not mean that we stifle individual opinion nor do we make any attempt to have our physicians think alike. We try to refrain from giving the family a definite final diagnosis until after the patient has been to staff conference. We tell the family that it is necessary to carefully study and examine the patient before giving a valid opinion. It is also helpful in keeping the younger members of the staff from giving out premature opinions regarding diagnosis and prognosis.

Sometimes patients do not get on well with the physician assigned to them. Antagonisms may develop between the doctor and the family and a request may come for a change of doctors. These matters need to be carefully studied and analyzed. After this a change may be made or the points of difference modified.

Occasionally families are very critical toward the physicians who have treated the patient prior to their admission to the hospital. They may feel that the patient has been mistreated and mishandled in a wide variety of ways. It is, of course, necessary for the physician in the hospital to listen to this discussion but he must be very careful not to be drawn into the fault of agreeing with the family, or, what is even worse, criticizing the doctor himself. The outside doctor has had to deal with the patient under quite different circumstances and many times before the patient's symptoms were well developed. Occasionally, of course, the outside physician may have erred but he may have been practicing at a level consistent with his group.

Occasionally the family may wish to have the patient seen by an outside consultant. Our hospital is so organized that there is virtually never a need for having outside consultants as far as the hospital is concerned. However, if the family makes such a request it is our

policy to discuss the matter frankly with them. Sometimes the problems they have in mind can be settled by that conference alone. However, if they still wish a consultant we are always agreeable providing the consultant is a doctor of definite standing. When such a consultant comes to the hospital we take special pains to make him welcome and give him the benefit of all the information in our records. We often find it helpful to be present at a conference between the consultant and the family immediately after the consultation. At this time we can clear up points with the consultant or the family.

The records of psychiatric patients often contain a great deal of information of a very personal nature. Families are loathe to discuss these matters unless they can have full confidence that the patient's records will be kept strictly protected. Our records are kept in the physician's office during the patient's hospital residence and after that in locked files. We are very careful to obtain written permission from the family before giving out any information regarding the patient to insurance companies, employers, schools, etc.

If correspondence between the hospital staff and the family is sent and received through one doctor, a proper check and uniform policy is maintained which prevents misunderstandings. All letters to families are sent over the signature of the medical director. While we are willing to discuss symptoms, trends and treatment plans in letters, we usually avoid providing the family with the history of the case or a definite written diagnosis. Anyone who has read letters of the latter sort which have been carried around by patients and patients' families for years can understand why we have adopted this policy. The patients' personal mail is seldom interfered with. Incoming mail is usually given to the patient unopened except when the patient's physician knows that it would upset the patient. It may be necessary to advise relatives as to what they should write patients. The relatives may regard the patient's illness only on a conscious level and send letters containing such exhortations as—"now pull yourself together"—"I know you can snap out of it"—or—"you could get well if you would only put your mind to it and try harder to use your will power." Or, the family may paint a sad picture of conditions at home because of the absence of the patient and urge them to get well and come home. Outgoing mail of a very sick patient may all be sent to a responsible relative for disposition.

You are familiar with the remarks that are often made about the personality problems of the psychiatric patient's family. We often say that the treatment of the family is just about as important as the treatment of the patient. I do not propose to become involved at this point in a discussion of heredity, but it is certainly true that one often sees in the family many of the traits found in the patient or some personality trends which may in some way be partly responsible for the patient's illness. There seems to be some truth also in the statement that people are inclined to be attracted by individuals who have similar personality reactions. This is seen in the schizoid woman who marries a dreamy, introverted, artistic type of man. The consideration of whether or not the patient's illness is the cause or the effect of unusual personality patterns in the family group is too involved to fall within the scope of this paper. However, we might mention a few of the patterns. There is the domineering, gruff father who has suppressed his children; there is the overprotecting mother; there are the ineffectual, inadequate parents; there are even psychotic members of the family group. We see the spouse who is subject to elations and depressions with the resultant demand upon the patient. We see relatives who are definitely paranoid. In our first contact with them their projections may be directed towards an outside physician. Of course, when one realizes that they are dealing with this type of individual it is wise to be extremely careful in handling this person as sometimes their paranoid projections may begin to be directed toward the hospital and members of the staff. The psychiatrist is then called upon to utilize all his knowledge and skill in dealing with these individuals. Certain members of the family may be neurotic. A husband may be impotent or a wife frigid. Who has not tried to take a history from a compulsive, neurotic relative? Sometimes a series of psychotherapeutic interviews with the relatives may help a great deal in the readjustment that follows the patient's hospitalization. It is not entirely unusual to have relatives who may have certain psychopathic tendencies. Overt or latent homosexuality in a relative may be one of the patient's main problems. The handling of this relative in a therapeutic way is often a complicated and difficult problem. The excessive use of alcohol or drugs by members of the family may be an important factor in the development of the patient's illness. However, it is quite impossible to do very much with them in inter-

views. Sometimes more than one member of the family becomes a hospital patient. We recently had a situation in which the first patient was an adolescent girl suffering from hysteria. When her mother came to the hospital it was obvious that she was in a tense, anxious, paranoid state. Later the daughter was sent to another hospital and the mother entered the hospital following a suicidal attempt. It developed that the father also had many serious problems and he had to be seen for regular psychiatric interviews. A son has also shown behavior that indicates that he needs psychiatric care.

We have been discussing some of the problems encountered in the management of the psychiatric patient's family. As we have gone along some indication has been given as to how we have handled these problems. Perhaps at this time it would be wise to discuss in a general way some of the principles, techniques and philosophies underlying our procedures. We believe that the best approach is a direct one, and this should begin with the physician's first conference with the family. In some hospitals I know it is necessary to allow the family to talk with nurses, social workers and even lay persons connected with the hospital. We seldom use social workers in our In-Patient Service. We do not allow nurses to discuss patients' problems with the family. The nurses are only allowed to discuss such matters as how the patient is eating and sleeping, or what clothes, books or supplies he may need. In other words, the medical care and discussion of the patient's condition is the physicians' responsibility and is not delegated to any other group. We try to arrange the conferences with the physicians on an appointment basis so that the family will not have to wait. Sometimes it is wise to talk with one or two members of the family, other times the conference may be with several members and occasionally we have a joint conference with the family and the patient. We have never found that it was very helpful to give families books to read about psychiatric problems. They so often contain a great deal of material which does not apply to the patient's case. This brings in many new ideas and confuses the problem rather than to clarify it. I am well aware of the fact that these conferences with the family are time consuming, but where a problem is complicated it does require individual attention and much thought and skill. When talking with the family one must use terms that are readily under-

stood. Often times the family's emotional attitudes produce an intellectual impasse which needs skill and tact on the part of the physician to dissolve. Sometimes a psychiatrist will really evade the issue or defensively say a few neatly turned phrases couched in involved technical language. From the doctor's standpoint he may have met the problem completely but from the family's standpoint they are often no further ahead than they were when they came to the hospital.

Conservatism is an excellent attitude to have when dealing with families. Particularly in the early weeks of the illness a definite prognosis as to the course of the illness should be avoided. If it becomes evident that the prognosis is poor this in turn has to be brought home gradually to the family to prevent misunderstanding and undue emotional distress. Physicians who are absolutely certain of their diagnosis and prognosis will tell the family that John has dementia præcox and that there is nothing to do with him but put him in a state hospital, or, they will insist that Mary has a simple neurosis which can be resolved during a month's treatment. Both statements may be right but nothing is gained by being so arbitrary and the physician may have to change his opinion later. Every family wants direct answers and complete information. They want to know exactly what the diagnosis is and just how long the patient will be sick. Of course, many times after the patient has been studied and observed the experienced psychiatrist can make a fairly accurate diagnosis about such matters, but often it is better to say, "We really don't know. There are the following possibilities but that is as far as we can go." Too often the doctor feels that as soon as he has made a diagnosis his duty has been fulfilled.

We should remember that a cure is not the only goal in the practice of psychiatry. After all, the family have a problem—a sick patient who needs care and treatment. They may also be having a difficult time in accepting emotionally this situation. Sometimes there are feelings of guilt associated with the mental illness of a member of the family and the family should be given opportunities to express concretely their unconscious wish to make amends. Furthermore, much can be done for almost any patient. Physical disabilities can be treated, the patient's illness can be managed, and often habit training and good nursing are really helpful in preventing an early deterioration of the patient's habits and emotional

patterns. It is a source of great satisfaction to most families to know that the patient is being carefully examined and treated under the proper auspices. When the ultimate prognosis seems bad it is wise, therefore, to stress the importance of these other procedures. Families may not be able to accept a hopeless prognosis emotionally although intellectually they may be willing to accept it. They usually take patients to the doctors and hospitals that promise them something. It is not necessary to falsify the true facts or promise unexpected results but it can usually be shown that there are real advantages in proper treatment.

From some of the above remarks I think it is evident that I am strongly in favor of the policy of telling the patient and his family the truth. It is a rare occasion when distortion of facts really helps the final situation. Some families do want to know something immediately even if the prognosis appears discouraging. The psychiatrist knows that occasionally a member of the family will show little response when he learns that the patient has a serious chronic illness. These individuals may have a masochistic trend in their own personalities or a sadistic attitude towards the patient. However, for the general group of relatives it is better to educate them slowly, over a period of time by gradually giving them insight into the patient's condition and an interpretation of his symptoms in the light of the various factors involved.

Generally speaking, the physician may assume one of two attitudes in his general approach to the family. He may be active or passive. For the most part a quiet, interested, listening attitude is preferable. After all, the relatives need an opportunity to talk out their problems and as they often say, "Well, Doctor, it has been good of you just to let me come in and talk about this. I feel better already." In this sort of a situation the doctor can answer questions as they are presented by the relatives and check the relative when there are misunderstandings about the patient or the treatment. This sort of an attitude makes the family a part of the therapy. It allows them to take responsibility and to share in the attempt to understand the patient and treat him. The physician who expresses an aggressive attitude by rapid decision and anticipatory understanding may humble the family and discourage them in talking freely, so that important details of the total problem will often be lost. When the physician assumes this attitude he takes on tremendous responsi-

bilities because he is not taking the family into his confidence and he is not allowing *them* sufficient understanding to cooperate in the plans for the patient's treatment. Many times the treatment objective or goal is reached sooner with a more passive attitude than would have been reached with an aggressive one. I do not mean to infer by this that the passive physician does not have just as definite ideas and objectives. In fact, I think that underneath he is perhaps more aggressive and may be working harder than the individual who expresses himself freely. My point is that the final results and attitude of the family and the patient are more satisfactory when the physician is not as managing and aggressive in his approach. There are times, of course, when one must put a certain amount of pressure on the family but this should be done calmly and the problems presented in a logical and reasonable fashion. The ideal plan is to understand each member of the family and to have the family understand you. This will help in anticipating difficulties and problems in the treatment program for the patient. If problems are properly anticipated and managed they often never become difficult problems.

The psychiatrist often has specific and practical questions to answer. For example, a family will want to know whether the patient should marry, or whether the patient should have children following an illness; the question of obtaining a divorce or a separation will be presented; the patient or members of the family will ask whether they should have sex relations, possibly of the extramarital type. Occasionally a patient has become pregnant during the prehospital hypomanic period. The child is illegitimate and the problem will arise as to whether or not the pregnancy should be interrupted. Not infrequently involved religious problems will be presented. In all of these the attitude of the physician in talking with the family should be one of great conservatism. Such questions will often raise issues with religious, moral, legal and philosophical implications. It would seem to me the doctor's main function is to provide the family with an opportunity to discuss all of the various phases of the problem and to present to them the facts in an objective manner but the family and not the doctor should make the final decision. The doctor should give advice in regard to these matters but should not be put in the position of having to force the patient or the family into a solution of the problem. Families often mis-

construe what the doctor says or change their own emotional attitudes and viewpoints later on. The main purpose of the hospital is to treat the immediate problems of the patient. It is not the function of the hospital to decide whether or not a couple should be divorced. The hospital, therefore, should realize its limitations of function. The ideal hospital should always present a logical, workable plan to the family which will meet as completely as possible all of the patient's needs. To meet the patient's problems this plan would have to satisfy, (1) the physical and emotional needs and attitudes of the patient; (2) the financial circumstances of the family; (3) the emotional and intellectual attitudes of the patient's family; and (4) any needs for improving the relationship between the patient and his family.

Another aspect of this consideration relates to the policies concerned in the discharge of patients. When it becomes evident that the patient should be discharged home or transferred to another hospital we begin first by preparing the family. It may be necessary to suggest readjustments in the home, such as a smaller apartment or the presence of fewer relatives, or some servants. A nurse may be helpful or a trial period at home after extended week-ends have shown an ability to adjust. The family should be told the limitations of the patient and advised regarding their attitude toward the patient.

Sometimes the family will suggest a trip after the discharge. Usually this is inadvisable since it puts an additional strain on the patient when he is trying to return to a normal life situation.

We usually send the patient back to the referring physician or to a psychiatrist although occasionally we may have to follow a case.

If the patient has to go to another hospital we confer with the family concerning the different hospitals available in terms of the patient's illness, desired treatment and financial circumstances. When patients have to be committed to other hospitals it is necessary to explain to the family the various legal aspects and, of course, the necessity for forcing the patient to accept treatment. Many emotional problems and prejudices must be met here. Again the final decision must be left to the family after they have been given the facts and the opinion and advice of the medical staff.

Although the patient is the immediate problem, as far as treatment is concerned, in this paper we have tried to emphasize that his illness has developed in relation to many problems—one of the most important of which is his family. Also, that in treating the patient

we must work with the family and enlist them in the treatment program. We can do this best by carefully and frankly explaining each step of our therapeutic activity. It may be necessary to try to modify the family's attitudes but above all we should have a sympathetic, tolerant, psychiatric attitude toward the family.

DISCUSSION.

DR. SYDNEY KINNEAR SMITH (Oakland, Calif.).—One word suggests itself to me as descriptive of Dr. McNiel's consideration of the technique of handling the families of patients, and that word is the good old English word "homely."

In this country the word "homely" usually refers to something that is ugly or unpleasant in some way to look upon. While living in England some years ago, I came to know this word in a sense that it is used there—that is, as a word descriptive of something commonplace, everyday, comfortable, and generally speaking, a word of commendation rather than one of rather unpleasant nature. Therefore, I would say with all appreciation of a good paper that it is homely, commonplace and of everyday usable application. We need more papers of this sort in our sections.

We spend a large part of our time in our annual sessions in the discussion of highly theoretical problems, as we should do if we are going to advance our knowledge of the science and art of psychiatry, and a lesser amount of time to certain very concrete therapeutic procedures—insulin therapy, chemotherapy in paresis, and so forth.

But it is rather seldom that we devote time more than indirectly to the consideration of the techniques of contact with patients or, as in this instance, with their families. It is certainly worthwhile for us to stop occasionally and take stock of ourselves in our relationships with these groups, with the aim of improving ourselves in this regard.

A study along this line was suggested to me several years ago by Dr. Walter Alvarez, of the Gastro-enterology Service of the Mayo Clinic, who is himself a first-rate psychiatrist, although he would deny this accusation most emphatically. Something of his point of view is expressed in his book on the nervous stomach, and it coincides largely with the views and procedure as expressed by Dr. McNiel.

In addition to the suggestions as to perfecting our technique of contact with the families of patients, he suggested as a second step a detailed study of the personalities of the family group as related to the patient and his problems, a point mentioned all too briefly in Dr. McNiel's paper and which I hope may be the subject of a future paper from the same source.

John Watson in his book on the training of infants remarks at the outset that there might be a real chance for children to grow up into normal individuals if they could be removed from their families at birth or shortly thereafter. It will probably be some time before Dr. Watson's glorious or inglorious ideal can be accomplished, and in the meantime we will continue to en-

counter the families of patients and will have to do a fair amount of our work in these cases with the family as well as with the patient.

Until we learn the lessons pointed out in this paper—essentially the lessons of tolerance and restraint—we will not be doing a complete piece of work. Certainly the keynote in learning this lesson and in practicing it is the procedure of cautious education, taking the family into our confidence as much as we practically can, looking toward their better immediate contact with the patients during periods of visiting, but more important, looking toward improved family-patient relationship after the patient has returned to the home environment.

In this regard I would like to mention one point with which I am sure Dr. McNiel would agree, that in preparing the family to regard the patient when he reënters the family circle as a normal human being and not as some unusual freak of nature, or something to be constantly watched out of the corner of the eye, as they say, fearing that at any moment he may do some bizarre or reprehensible thing.

Often patients tell the psychiatrist of this family attitude, and even express a desire to get back to the hospital or sanitarium where they were treated in a matter-of-fact way in preference to being in a setting where, directly or indirectly, they are made to feel that they are being scrutinized for some unusual word or action.

It is difficult for even the most intelligent family group to overcome this difficulty and the development of a casual attitude needs constant emphasis from the physician in preparing a family to receive the recovered patient. If watching for untoward conduct is necessary, then obviously the patient is not sufficiently recovered to be at home.

Another point that I have found useful in discussions with families is an explanation of the patient's conduct in terms of normal or understandable conduct. The exaggeration of the manic symptomatology may become much less alarming to the family when we suggest to them its similarity to periods of conduct on the part of all of us.

They may understand the manic picture and regard it with less fear if we remind them of socially correct conduct at a football game, or on the night of November 11, 1918. The explanation of unusual conduct in terms of exaggeration of the normal, as nearly as is consistent with the truth, is helpful and helps in building up an attitude of playing with the family instead of playing opposite them.

DR. THEOPHILE RAPHAEL (Ann Arbor, Mich.).—Dr. McNiel, I feel, is to be congratulated for his very full and clear presentation. There can be no question that the family does represent a vital element in the picture, without adequate recognition of which the psycho-therapeutic approach, viewed broadly, certainly cannot be successful.

It appears clear that this particular aspect has not been given the recognition that it should be given, and has not been as completely investigated as would be best.

In exploring this matter as he has, Dr. McNiel, I feel, has made a really worthwhile and provocative contribution.

THE RESULTS OF EIGHTEEN MONTHS OF BENZEDRINE SULFATE THERAPY IN PSYCHIATRY.*

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Since Alles [1] and Prinzmetal and Bloomberg [2] called attention to the stimulating effect on the central nervous system of benzedrine sulfate (betaphenylisopropylamine sulfate), this action has been confirmed by numerous other investigators. In previous communications [3, 4, 5, 6, 7, 8, 9] we have suggested that the response of an individual to benzedrine sulfate must be assumed to represent the reaction of the whole organism, and therefore to include the action on the entire sympathetic nervous system (pseudo-sympathomimetic effect) as well as the parasympathetic system. Since January, 1936, we have been attempting to utilize the stimulating action of this drug in all psychiatric conditions where depression was a prominent feature.

PROCEDURE.

Following the method of investigation and observation previously reported, benzedrine sulfate was administered to 145 patients with organic and functional mental states, as well as to a number of non-psychotic individuals with organic disease and to normal persons. In the organic psychoses we included pathologic mental states due to alcohol, barbiturates and morphine; psychoses due to infection with encephalitis and syphilitic meningo-enceph-

* Read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, California, June 6-10, 1938.

From the Department of Psychiatry, Syracuse University College of Medicine; and from the Syracuse Psychopathic Hospital, Dr. Harry A. Steckel, Director.

We are indebted to Mr. Theodore B. Wallace of Smith, Kline and French Laboratories for the benzedrine sulfate used in this study.

alitis and psychoses due to trauma. In the functional group patients with dementia precox, manic-depressive psychoses and psychoneuroses were studied. All patients were subjected to careful physical and mental observation prior to receiving the drug. In the organic states depending on the condition, the patients received 10 to 30 mg. of the drug by mouth for periods varying from three days to three months or more except in instances where the drug had to be discontinued because of undesirable reactions. In the functional cases the drug was administered for a period of 10 days to three months or more. All cases herein described were diagnosed according to the classification adopted by The American Psychiatric Association.

CRITERIA FOR JUDGING IMPROVEMENT.

The following factors were taken into consideration in designating a patient as improved:

(A) The opinion of staff members who frequently were unaware of the medication or procedure employed in a given case.

(B) The response as compared with control cases.

(C) The total coordinate reaction of the individual, rather than the response in any particular phase or at any particular time. Transitory amelioration of symptoms was not considered improvement.

1. Psychoses Due to Intoxication, Infection and Trauma.

Rapid dissipation of the psychotic state including confusion with improvement in mood, speech and coordinate motor activity, accessibility, and general efficiency were considered criteria in determining the improvement of these patients.

2. Dementia Precox.

(a) Eligibility for parole; improvement in coordination of mood, speech and motor activity; improved insight; increase in general efficiency and accessibility; and decrease in asocial behavior were considered criteria for classifying a patient as *much improved.*

(b) Improvement in social adaptibility; moderate increase in general efficiency, accessibility, speech and motor activity; with

less pronounced improvement in mood and coordination of activity were considered in designating a patient as *improved*.

(c) Minimal improvement in coordination of activity and social adaptability, with or without response in any particular phase was considered in rating a patient as *slightly improved*. Increased accessibility alone was not considered to represent improvement.

3. Manic Depressive Depressed Psychoses.

Rapid elevation of mood with increased speech and motor activity, accessibility and general efficiency were considered criteria in determining the improvement.

4. Psychoneuroses.

Disappearance of depression and amelioration of the predominant psychoneurotic complaint were considered criteria in judging improvement.

ANALYSIS OF RESULTS.

(A) Organic Psychoses.

In our experience, in the organic psychoses characterized by depression, the abnormal mental states due to intoxication were more beneficially influenced than those of infectious or traumatic origin. In alcoholic psychoses of recent onset 93 per cent of 28 cases were benefited.[8] As is to be expected, the cases of pathologic intoxication reacted strikingly to the drug. In delirium tremens and in early cases of acute hallucinosis the response was also favorable. In cases of chronic hallucinosis and in Korsakow's syndrome the results were not as gratifying. Sixty-seven per cent of the early traumatic cases showed improvement. Fifty per cent improvement was observed in acute and subacute psychoses due to encephalitis. In organic psychoses, represented in our group by syphilitic meningo-encephalitis, where deterioration was in progress and defects of the sensorium or personality alteration had developed the response was uniformly unsatisfactory. In psychoses resulting from intoxication with barbiturates and morphine we have noted results comparable with those of the alcoholic group. These results are indicated in Table I.

(B) Functional Psychoses.

1. *Dementia Precox.*—When the results of oral ingestion of benzedrine sulfate were analyzed according to length of illness it was observed that patients with dementia precox of less than two years duration were affected beneficially with much greater consistency than those who had been ill for longer periods of time. These results are indicated in Table II. Fifty-eight per cent of

TABLE I.

Effect of Oral Benzedrine Sulfate in Psychiatric Conditions.

	No. of cases.	Much improved.	Improved.	Slightly improved.	Unimproved.	Total cases favorably influenced.	
						No.	Per cent
Organic Psychoses:							
Psychosis due to Intoxication:							
(a) Alcohol	28	26	0	0	2	26	93
(b) Barbiturates	17	13	2	1	1	16	94
(c) Morphine	4	3	0	0	1	3	75
Psychosis due to Infection:							
(a) Encephalitis	6	0	3	0	3	3	50
(b) Syphilis: Meningo-encephalitis	4	0	0	0	4	0	0
Psychosis due to Trauma	6	3	1	0	2	4	67
Functional Psychoses:							
Dementia Precox	45	6	6	3	30	15	33
Manic Depressive Depressed	20	3	3	0	14	6	30
Psychoneurosis	15	2	2	0	11	4	27
Total	145	56	17	4	68	77	53
Total Organic Psychoses	65	45	6	1	13	52	80
Total Functional Psychoses	80	11	11	3	55	25	31

the 19 cases of recent onset were improved, while only 15 per cent of the 26 cases of longer duration were beneficially affected. When the 45 cases were considered, regardless of duration, 15, or 33 per cent, showed improvement.

In the catatonic group 12 cases (37 per cent) showed improvement. Nine of 14 early cases were benefited. Increased accessibility was found in all of the 12 improved cases and in two others. Increased general efficiency was observed in 13, increased motor activity in 15, increased speech activity in 11, elevation of mood in seven, and a state of increased irritation in six. Catalepsy dis-

appeared in two patients, and two mute patients began to talk. However, six patients showed an increase in asocial behavior.

Only one of five hebephrenic patients showed improvement. Two paranoid individuals were classed as improved, but six showed both increased accessibility and increased speech activity, and these tended to uncover or elaborate their delusions.

TABLE II.

EFFECT OF BENZEDRINE SULFATE IN PSYCHIATRIC CONDITIONS.

DEMENTIA PRECOX CASES COMPARED WITH CONTROL CASES.

	No. of cases.	Much improved.	Improved.	Slightly improved.	Unimproved.	Total cases favorably influenced.	
						No.	Per cent.
Dementia Precox Cases:							
(a) Under two years' duration..	19	5	4*	2	8	11	58
(b) Over two years' duration...	26	1	2	1	22	4	15
(c) Total.....	45	6	6	3	30	15	33
(d) Total catatonics.....	32	6	4	2	20	12	37
Control Cases:							
Dementia Precox: Catatonic Group							
(a) Ephedrine sulphate†.....	22	0	1	2	19	3	13
(b) Lactose†.....	22	0	0	0	22	0	0
Routine Hospital Procedures:							
Catatonic Group:							
(a) Under two years' duration:							
Self-absorbed.....	25	1	2	4	18	7	28
Excited.....	25	2	2	2	19	6	24
Total.....	50	3	4	6	37	13	26
(b) Over two years' duration...	25	3	3	2	17	8	32
(c) Total catatonic group.....	75	6	7	8	54	21	28
Dementia Precox: All Types.....	300	8	24	41	227	73	24

* Two of the cases recorded as improved on subsequent observation were classed as slightly improved.

† Response estimated for one week, after which benzedrine sulfate was given.

2. *Manic Depressive, Depressed Psychoses.*—Of 20 cases, the rate of improvement was apparently accelerated in six or 30 per cent. In half of the cases a state of increased irritation was produced while in only six cases was there an elevation of mood. Because of the inherent tendency of this group to improve it was difficult to estimate the effect of the drug.

(C) Psychoneuroses.

The greatest difficulty in evaluating the effect of the drug was encountered in this group. However, most striking was the lack of consistent response in all phases in any given case. The lack of improvement in general efficiency was also notable. Amelioration of the predominant psychoneurotic complaint was found in only four of the 15 cases (27 per cent). Elevation of mood occurred in the same number of cases. The underlying psychoneurotic tendency was apparently unchanged.

(D) Comparison of Organic and Functional Mental States.

Comparison of the response of organic and functional psychoses seems to indicate that benzedrine is more effective in early toxic and infectious conditions than in functional abnormal mental states. In sub-acute organic psychoses its value is still to be determined.

(E) Control Data.

The accelerated rate of improvement in patients with intoxications due to alcohol was determined by comparison with an equal number of consecutive cases treated by the routine procedures employed at the Syracuse Psychopathic Hospital. In cases of delirium tremens the results with benzedrine sulfate were at least as effective as those obtained with spinal fluid drainage. None of the pathological intoxication cases thus far treated by benzedrine sulfate required commitment to a chronic mental hospital. Similar control observations were made in psychoses due to barbiturates and morphine and the encephalitic, and the traumatic groups.

Control data for the dementia precox group is indicated[7] in Table II. Twenty-four per cent of 300 cases of dementia precox of all types regardless of duration showed improvement. The comparative effects of ephedrine, lactose and routine hospital procedures were evaluated. The manic depressive depressed cases were compared with routine hospital admissions, and slightly less than one third showed an accelerated rate of improvement. The response of the psychoneurotic cases differed little from those receiving only routine hospital care.

(F) Miscellaneous Conditions Without Psychosis.

Alcoholism.—In states of acute alcoholism without psychosis benzedrine sulfate produced a satisfactory response.[8] We have aroused several patients in alcoholic stupor within 30 minutes by injection of 10 to 30 mg. of the drug intravenously. The depression and other symptoms characteristic of a "hangover" following a debauch were rapidly dissipated by the drug. The drug had a similar beneficial effect on the symptoms occurring in chronic alcoholics. The value of the drug in overcoming chronic alcoholic habituation remains to be determined; however, it is open to question whether this drug which is habit forming in itself, should be administered to persons who have demonstrated a tendency to addiction by their alcoholic habits.

Barbiturates and Morphine.—We have found that benzedrine sulfate will quickly arouse patients intoxicated with moderate doses of barbiturates.[5] However, in poisoning from massive doses results have not been as favorable,[9] because of the physiologic depression by the barbiturate of the respiratory center which is unresponsive to benzedrine, and because of the extent of the toxic pathologic process. There is some evidence to indicate a synergy of harmful effect in combined massive doses of both drugs. In stupors due to morphine, benzedrine sulfate appears to be of value in shortening the comatose period when used in conjunction with the other recognized procedures. The drug appears to be of value in counteracting withdrawal symptoms. As in chronic alcoholism, the value of the drug in morphine addiction is still to be determined.

Narcolepsy.—A review of the literature[9] reveals a total of 58 patients with narcolepsy who have been treated with benzedrine sulfate. Of these 98 per cent obtained relief from the attacks. These results are indicated in Table III. We have observed beneficial response in three cases, but found that the drug had no effect on the narcoleptic attacks of a patient who developed a transitory psychosis and who subsequently was proven at post mortem to have Wilson's disease. Benzedrine sulfate cannot be expected to produce results in the presence of gross organic pathology. A narcoleptic patient with a psychotic state showed improvement in the narcolepsy but an aggravation of the delusions and hallucinations. Similar unfavorable response of narcoleptics with psychoses have been reported by others.[10, 11]

TABLE III.

THERAPEUTIC USE OF BENZEDRINE SULFATE.

NARCOLEPSY.

Author and date of reading or publication of data.	No. of specific cases reported.	Daily oral dose (mg.).	Cases improved.		Comment.
			No.	Per cent.	
Prinzmetal and Bloomberg (Dec. 21, 1935)...	9	10–90	9	100	Three times as effective as ephedrine; benefit maintained over three years.
Bloomberg (Mar. 19, 1936).....	26	.....	26	100	
Ulrich, Trapp and Vidgoff (March, 1936)....	6	25–50	6	100	Benefit maintained over two years.
Davidoff (October, 1936).....	1	30	(1)	(100)	Narcolepsy benefited; psychosis aggravated.
Shapiro (January, 1937).....	2	20–30	2	100	
Nathanson (Feb. 13, 1937).....	2	.....	2	100	
Guttmann and Sargent (May 15, 1937).....	2	10–20	2	100	
Solomon, Mitchell and Prinzmetal (May 22, 1937).....	1	40–60	(1)	(100)	Narcolepsy benefited; psychosis aggravated.
Tihen (May, 1937)	2	20	2	100	
Ulrich (Oct. 28, 1937).....	3	20–30	3	100	
Reifenstein and Davidoff (May 10, 1938)....	4	10–20	3	75	One case (Wilson's disease) not affected.
			55	94.8	Complete relief.
			(2)	(3.5)	Narcolepsy benefited; psychosis aggravated.
Total.....	58		57	98.3	Narcolepsy benefited.

TABLE IV.

THERAPEUTIC USE OF BENZEDRINE SULFATE.

POSTENCEPHALITIC PARKINSONISM.

TABLE IV.

THERAPEUTIC USE OF BENZEDRINE SULFATE.

POSTENCEPHALITIC PARKINSONISM.

Author and date of reading or publication of data.	No. of specific cases reported.	Daily oral dose (mg.).	Cases improved.		Comment.
			No.	Per cent.	
Solomon and Prinzmetal (Mar. 19, 1936) (18 cases)					
Solomon, Mitchell and Prinzmetal (May 22, 1937) (Additional 10 cases)	28	10–160	26	93	Most effective with scopolamine.
Davidoff (October, 1936)	2	10	2	100	Most effective with stramonium.
Stewart (Oct. 9, 1936)	90	40–60	77	85	Most effective with scopolamine or stramonium.
Finkelman and Shapiro (July 31, 1937)	12	20–30	10*	83	Most effective with atropine.
Sobin (December, 1937) (Autobiography)	1	20–40	1	100	Most effective with stramonium.
Matthews (April, 1938)	20	15–90	15	75	Most effective with stramonium, atropine or scopolamine.
Reifenstein and Davidoff (May 10, 1938)	6	10–30	4	67	Most effective with stramonium or scopolamine.
Total	159		135	84.9	

* Two patients died of pneumonia during an influenza epidemic.

OCULOGYRIC CRISES.

Author.	No. of cases having crises.	No. of cases with crises abolished.	No. of cases with decreased number or severity of crises.	Total number of cases receiving some form of benefit.
Solomon, Mitchell and Prinzmetal	8	6	2	8
Stewart	..	..	several	..
Finkelman and Shapiro	7	2	5	7
Matthews	6	1	4	5
Total	21	9 (42.7%)	11 (52.3%)	20 (95.2%)

Postencephalitic Parkinsonism.—The literature to date[9] contains 159 cases of postencephalitic Parkinsonism treated with benzedrine sulfate combined with scopolamine, stramonium or atropine. Of these 85 per cent showed improvement. Beneficial response has been recorded in 95 per cent of 21 cases with oculogyric crises. These results are indicated in Table IV. In our experience benzedrine sulfate has been a beneficial adjuvant to stramonium, scopolamine or atropine in four of six patients with postencephalitic Parkinsonian syndrome where there were minimal organic defects and personality changes. However, patients with demonstrable psychotic states were not as favorably influenced.

Habit Formation.—A number of our patients have enjoyed the sensations produced by benzedrine sulfate, and have requested further doses of the drug. We are convinced that in certain persons at least, benzedrine sulfate is habit forming. We have noticed this tendency in individuals addicted to alcohol, morphine and other drugs, in neurotic persons who crave medication, and in people who work under excessive strain such as actors, students, nurses and physicians. The benzedrine habit seems to be similar to the daily use of moderate amounts of caffeine, nicotine and alcohol. At present there is insufficient evidence to definitely establish whether the patient is worse after benzedrine has been discontinued than he was prior to its administration. The development of tolerance, as mentioned by Wilbur, *et al.*,[12] is consistent with habit formation. The indiscriminate use of the drug by laymen must be condemned.

DISCUSSION.

We have found benzedrine sulfate to be of most value in states of depression of recent onset due to drugs, particularly alcohol. We have observed that benzedrine sulfate at times may be of value in differentiating the states of depression due to alcohol alone, which are usually rapidly dissipated by the drug, from the states of alcoholic depression superimposed on and masking depressions of psychogenic origin, which do not respond as readily to the drug. In states of intoxication or infection where no psychosis is demonstrable, benzedrine usually produces a more satisfactory response than in the states of intoxication or infection where a psychosis exists. In the states of intoxication and infection benzedrine sul-

fate may exert its effect by stimulation of the central and sympathetic nervous systems thus dissipating the depression and also by neutralizing the depressant itself.

In those cases of dementia precox with self absorption as a prominent feature, benzedrine sulfate appears to be more effective in the catatonic types and those of recent onset. In such cases it may be of value in rendering patients more adaptable and more accessible to understanding, investigation and psychotherapy; it may indicate to some degree the plasticity of the personality; and it may promote more coordinate activity. In those cases of schizophrenia which are inherently capable of being stimulated to some degree of improvement, benzedrine may initiate, accelerate, augment and/or indicate such improvement. In the functional psychoses benzedrine sulfate may exert its effect by increasing the number of available pathways of reaction as a result of the stimulation of the central and sympathetic nervous systems combined with the secondary response of the parasympathetic nervous system. Long continued observations of a large series of patients correlated with adequate control studies will be necessary before we can determine the value of the benzedrine sulfate procedures in the treatment of dementia precox. Until recoveries from this mental illness are recorded as "5 and 10 year cures," as is done in estimating response in neoplastic disease, we will be unable to evaluate properly the worth of any of the pharmacotherapeutic procedures now in vogue.

We do not consider that the value of benzedrine sulfate in the manic depressive psychoses of the depressive type has been demonstrated to date by any of the investigators. However, the possibilities of the drug in this psychosis have not been sufficiently studied. Adequate control data are also needed. We feel that theoretically the drug is not suitable for use in severe states of depression because of our previous observations that the drug has less effect in elevating the mood than in producing acceleration of motor and speech activity.

The psychic effect of the increased attention to the patient entailed in the administration of benzedrine sulfate cannot be disregarded. We have previously called attention to the difficulty in evaluating and discriminating between the psychologic and the

physiologic reactions to the drug. This is well demonstrated in psychoneurotic states.

Because of the danger of untoward effects or idiosyncrasies, it must be emphasized that benzedrine sulfate administration should always be initiated with small doses (5 to 10 mg.). Certain untoward reactions in the course of the administration occasionally occur. These have been mentioned in detail elsewhere,[4, 9] but briefly include insomnia, a state of restless irritability, aggravation of the psychotic state, and evidences of overstimulation of the sympathetic nervous system. These at times counterbalance the beneficial action of benzedrine sulfate. Definite contraindications to the use of the drug include (a) hypertension, (b) coronary artery disease, and (c) a state of excitement. We have previously outlined conditions in which the drug must be administered with considerable caution.[4, 9] In our experience anxiety states have usually been aggravated by the drug. For this reason we hesitate to administer the drug to persons with anxiety neuroses, involution melancholia and mixed manic psychoses. Benzedrine sulfate can be more safely prescribed when the patient is under close observision in a hospital, and its use in outpatient practice should be undertaken with considerable caution and only under favorable circumstances. Regardless of whether the drug is administered in inpatient or outpatient practice results can be obtained and the value of the drug determined only through the establishment of a carefully planned and intensively pursued régime adapted to the individual patient.

From a psychiatric point of view the use of benzedrine sulfate is best established in the treatment of narcolepsy. The drug appears to have therapeutic usefulness in (1) intoxications and states of depression of recent onset due to drugs, particularly alcohol (the most useful and valuable application in our series of 145 patients herein reported); (2) postencephalitic Parkinsonism without psychosis, but only as an adjuvant to stramonium, scopolamine or atropine (although in our experience a less favorable application than the alcoholic cases); and (3) depressive psychoses of recent onset due to infection or trauma. The drug is of value to a more limited degree in self-absorbed states of dementia precox of recent onset, particularly catatonics. Much confirmatory data are

necessary to establish any value of the drug in manic depressive psychoses of the depressed type and in psychoneuroses.

Physiologic Effects.—An analysis of the pharmacology of benzedrine sulfate reveals considerable controversial and unconfirmed data. The pattern of reaction is variable, uncertain, unpredictable and at times paradoxical depending upon the individual medicated and the opinion of the investigator. The need for further study is apparent.

A provisional summary,[9] admittedly dogmatic, of the more prominent effects reported to date in addition to stimulation of the nervous system and mental functions includes:

(1) Ordinarily elevation of the systolic and the diastolic blood pressure levels occurring together or independently; occasional unpredictable decrease in the levels. Blood pressure variations are not criteria of the psychologic stimulation.

(2) Increase or decrease in pulse rate, not necessarily concomitant with blood pressure variations and depending frequently on whether the subject is ambulatory or recumbent.

(3) Lack of consistent effect on cardiac function with occasional disturbances in rhythm and conduction and precordial pain.

(4) Usually relaxation of gastro intestinal spasm; with a lack of agreement on the phenomena produced and a need for further investigation. Clinically, both increase and decrease of bowel function has been observed.

(5) No definitely established effect on the genito-urinary tract, with paucity of investigative data. Clinically, both increase and decrease of urinary function has been noted.

(6) Not infrequently a mild reduction of weight during initial periods of administration, usually not sufficient to be clinically significant.

(7) Occasionally moderate elevation of basal metabolic rate during initial periods of administration.

(8) Variable response of the skin, mucous membranes and vasomotor system, with flushing of the face, excessive sweating, dryness of the mouth and coldness and clamminess of the hands particularly noted.

(9) Apparently increased sensitivity in persons of asthenic habitus.

(10) Lack of definitely established effect on: bronchi, respiration, hematopoietic system, chemical elements of the blood, spinal fluid, urine, stool, deep reflexes, temperature and carotid sinus.

THEORY OF THE MODE OF ACTION.

It is well established that the action of benzedrine sulfate includes stimulation of the central nervous system. As stated in our previous publications, the stimulating effect of benzedrine sulfate on the entire sympathetic nervous system (*i. e.*, the pseudosympathomimetic effect) must also be considered in evaluating the action of this drug. It is recognized that there is variability in the action of both the sympathomimetic and the parasympathomimetic drugs.[13] Benzedrine sulfate, which is classed with the former, appears to be no exception to this. Its unpredictable action suggests that the response of each individual to the drug tends to vary with each individual as a total unit depending on the interaction of a number of factors rather than on the peripheral action alone. Among these factors might be included: the physical constitution of the individual; his endocrine status; his idiosyncrasy; his personality makeup and central affectual tendency; his psychologic reaction to the procedure based on his previous conditioning, existing mechanisms and complex-formations; the effect of this psychologic state on the physiologic reaction; the additional physiologic conditioning resulting from the procedure; the personality of the investigator and the reaction of the patient to him; the state of the entire nervous system, including the voluntary, the reflex, and possibly the extrapyramidal systems, and particularly the state of balance and tonus of the components of the entire vegetative nervous system.[14] The reaction of the autonomic nervous system may involve the state of the so-called "sympathetic centers" and the parasympathetic centers in the cortical (Orlandic), the diencephalic (hypothalmic), the mesencephalic, and the medullary-spinal regions; the state of the sympathetic and parasympathetic ganglia; the state of the sympathetic and parasympathetic efferent nerve fibers and their endings; and the tendency to specific circumscribed reactions, compensatory reactions, delayed responses, and after effects as pointed out by Pavlov[15] in his statements on positive and negative induction, and Sherrington[16] in his description of immediate and successive induction as part of the integrative

action of the central nervous system. As we have previously stated, disturbances in the vegetative nervous system almost invariably involve parasympathetic as well as sympathetic stimulation.

THE USE OF INTRAVENOUS BENZEDRINE SULFATE AND ORAL SODIUM AMYTAL.

Recently we have been employing in patients with dementia precox a procedure (described in detail elsewhere [7]) which combines on alternate days narcosis with sodium amytal orally and stimulation with 30 mg. of benzedrine sulfate intravenously. To date, 16 cases have been treated for periods of three to four weeks, and of these eight, or 50 per cent, have shown improvement, and have been discharged to their homes. No conclusions can be drawn because of the small series thus far treated and the short period of observation.

This procedure is now being employed in toxic psychoses and manic depressive states.

Because of the central stimulating action of benzedrine sulfate we originally avoided administering it to excited patients, and restricted its use to depressed schizophrenics. More recently, however, we have utilized the combination of benzedrine sulfate intravenously and sodium amytal orally for the following reasons:

1. It rendered all types of schizophrenics amenable to treatment with benzedrine sulfate, because the amytal narcosis produced sufficient depression in excited individuals so that benzedrine sulfate could then be administered.

2. It enabled us to utilize the recognized increased accessibility produced by continuous sodium amytal narcosis [17] in combination with the augmented accessibility resulting from the stimulating action of benzedrine sulfate. (Synergistic action.)

3. It allowed us to administer benzedrine sulfate intermittently thus avoiding the development of tolerance to the drug.

4. It permitted us to alternate depression with stimulation of the central nervous system, without the necessity of counteracting the effect of either drug. This produced in the central nervous system a cycle of alternating positive and negative shocks, which is represented graphically in Fig. 1. We are at present attempting to vary the cycle of alternating positive and negative shocks to correspond with the prevailing status of the individual at a given

time, either by repeating the injection of benzedrine sulfate on consecutive days, and thereby elevating the prevailing state, or by repeating the ingestion of sodium amytal on consecutive days and producing a depression of the prevailing state.

On the basis of the theories of Jackson,[18] Head,[19] Pavlov,[15] Sherrington,[16] Kempf,[20] Freud,[21] Rivers,[22] Jung,[23] and Meyer,[24] we might postulate that the synergistic therapy of alternating stimulation with benzedrine sulfate and depression with sodium amytal attempts to produce pseudo stimulation of the autonomic nervous

'Positive Shocks'
Intravenous Benzedrine Sulfate
Prevailing Status of Patient at Time of Administration
Oral Sodium Amytal
'Negative Shocks'
0 1 2 3 4 5 6 7 8
Days

FIG. 1.—Rationale of Alternate Intravenous Benzedrine Sulfate and Oral Sodium Amytal in Dementia Precox.

system and repressed lower center functions, and to produce at the same time a more coordinate action of the integrated functions of the central nervous system. This does not imply modification of the total personality, but suggests rendering a given personality more adaptable in a given environmental situation by increasing the number of available pathways of coordinate action. We recognize that the procedure employed is non-specific and the drugs may not be ideal for these objectives.

Levy Simpson[25] of London has suggested, "the therapeutic stimulating effect of insulin hypoglycemia in schizophrenia may be

partly due to the secretion of epinephrine, which may continue for some hours. If so, this therapy would be comparable to that of benzedrine."

REVIEW OF THE LITERATURE.

A number of other investigators have studied the effect of benzedrine sulfate in certain psychiatric conditions. These reports are illustrated in Tables V and VI Myerson [26] in October, 1936, reported that benzedrine sulfate had an ameliorative influence on the morning apathy and depression occurring in certain cases of neuroses associated with depression, fatigue and anhedonia. He stated briefly that the drug had apparently no beneficial effect in catatonic states or hebephrenia. In a later report, Schube, McNanamy, Trapp and Myerson,[27] reported that benzedrine was of no value in any case of a series of 80 patients with major psychoses, including 38 dementia precox, 32 manic-depressive, depressed and five neurasthenic cases. There was a temporary accentuation of the psychosis in 15 cases. Guttmann [28] in September, 1936, mentioned encouraging results from the use of benzedrine sulfate in depressive states. He later reported with Sargent [29] that patients with mild depression accompanied by retardation were most favorably influenced by benzedrine therapy. He commented on the accelerated rate of improvement in these cases; noted that the drug had little effect in severe depressions and stupors and that it usually aggravated anxiety states. In schizophrenia he stated that benzedrine sulfate was of value in producing increased initiative, and improved activity; but cited the occurrence of excitement in some of the patients with catatonic stupors. In January, 1937, Carlisle and Hecker [30] reported five cases of catatonic stupor of over three years duration treated with benzedrine sulfate. No effect was observed, except for the sudden onset of excitement in one patient.

Nathanson [31] in February, 1937, reported that the drug acted favorably in states of "persistent exhaustion" and in individuals who become easily fatigued. About the same time Wilbur, MacLean and Allen [32] studied the effect of benzedrine sulfate in 100 cases in which there were disorders of mood (chiefly depression), "chronic nervous exhaustion," and psychoneurosis. In about 80 per cent of the cases of "chronic exhaustion" or depression the immediate results were favorable, and in some instances spectacular, leading to

TABLE V.

Therapeutic Use of Benzedrine Sulfate.

FUNCTIONAL PSYCHOSES.

Disease condition and author.	No. of cases reported.	Cases improved.		Comment.
		No.	Per cent.	
Dementia Precox:				
Davidoff (October, 1936) Davidoff and Reifenstein (May 22, 1937) Davidoff and Reifenstein (April 23, 1938)	45	15	33	Self-absorbed patients of all types. In cases inherently capable of being stimulated to improvement benzedrine may initiate, accelerate, augment and/or indicate such improvement.
Myerson (October, 1936)	18	0	0	Catatonics and hebephrenics.
Carlisle and Hecker (January, 1937)	5	0	0	Catatonics of over three years' duration.
Bloomberg (February, 1937)	1	1	100	Moderate improvement in one catatonic.
Schube, McNanamy, Trapp and Myerson (July, 1937)	38	0	0	Psychosis aggravated in three cases.
Wilbur, MacLean and Allen (Aug. 21, 1937)	3	1	33	Marked improvement in one hebephrenic.
Donley (November, 1937)	2	0	0	Transitory stimulation.
Woolley (January, 1938)	44	11	25	Aggravation of another 25 per cent.
Manic Depressive, Depressed:				
Davidoff and Reifenstein (May 22, 1937) Reifenstein and Davidoff (May 10, 1938)	20	6	30	Increased irritation in 10 cases.
Reiter (April 29, 1937)	26	16	62	Marked improvement in only five cases.
Schube, McNanamy, Trapp and Myerson (July, 1937)	32	0	0	Psychosis aggravated in 10 cases.
Wilbur, MacLean and Allen (Aug. 21, 1937)	10	7	70	Benefit continued after six months in only one-quarter of cases.
Donley (November, 1937)	3	0	0	Transitory stimulation in two cases.
Woolley (January, 1938)	17	4	23	Marked improvement in only one case.

TABLE VI.

THERAPEUTIC USE OF BENZEDRINE SULFATE.

PSYCHONEUROSES.

Disease condition and author.	No. of cases reported.	Cases improved.		Comment.
		No.	Per cent.	
Cases Diagnosed as "Chronic Exhaustion":				
Nathanson (Feb. 13, 1937)	40	32	80	
Wilbur, MacLean and Allen (Aug. 21, 1937)	32	25	78	Benefit continued after eight months in only one-half of cases.
Cases Diagnosed as Psychoneurosis:				
Davidoff and Reifenstein (May 22, 1937) Reifenstein and Davidoff (May 10, 1938)	15	4	27	
Myerson (October, 1936)	9	7	78	Cases with fatigue and anhedonia.
Solomon, Mitchell and Prinzmetal (May 22, 1937)	22	2	9	
Wilbur, MacLean and Allen (Aug. 21, 1937)	35	16	46	
Reiter (April 29, 1937)	16	10	63	Marked improvement in only three cases.
Woolley (January, 1938)	5	1	20	

complete relief of exhaustion, to marked exhilaration, and to increased capacity for physical and mental effort. When benzedrine was given to psychoneurotic patients, particularly to those who were anxious, highly nervous, and apparently stimulated, it had a less favorable immediate effect. In a later report, the same authors [12] stated that approximately 80, 70 and 46 per cent of patients with "chronic exhaustion," depression and psychoneurosis respectively were beneficially affected immediately, but that the effects of continued administration were less favorable. Of the patients initially benefited about 50 per cent who had "chronic exhaustion" and 25 per cent who had depression continued to receive benefit for periods of from one to eight months. No effect was observed in two patients with catatonic dementia precox, but there was a very favorable response in one case of hebephrenia. Three chronic alcoholic patients had marked relief from their craving for alcohol. These authors mentioned that some persons who have indulged in too large quantities of alcohol may find that the characteristic morning "hang over" is greatly benefited by benzedrine.

Bloomberg [33] in the same month reported a case of catatonic stupor that responded moderately to benzedrine sulfate. Reiter of Denmark [34] in April, 1937, stated that 16 of 26 cases of manic depressive psychosis improved, with marked improvement in only five; and that 10 of 16 psychoneurotics improved with marked response in only three cases. Solomon, Mitchell and Prinzmetal [10] in May, 1937, found benzedrine sulfate to be of no value in 20 out of 22 cases of psychoneurosis with asthenia as a prominent symptom, and noted the frequent occurrence of untoward effects in this group. Donley [35] in November, 1937, treated with benzedrine sulfate three manic-depressive depressed, two dementia precox, two involutional and one psychoneurotic patient. She observed in all temporary stimulation of cortical functions with increased motor activity, increase in the amount of relevant and coherent speech, and increased accessibility which aided in the institution of psychotherapy; however, all of the patients soon became refractory to the drug.

In January, 1938, Woolley [36] reported the administration of benzedrine sulfate for periods of six to 19 months to a total of 70 patients including 44 with schizophrenia, 21 with depressive states, and five with psychoneurosis. Roughly 25 per cent of the

retarded patients in all diagnostic groups were improved, while another 25 per cent were made much worse, and the remaining 50 per cent appeared unaffected. Woolley stated that benzedrine sulfate may on occasion determine the difference between prolonged serious illness and fairly prompt recovery. He observed increase in euphoria, initiative and accessibility after using the drug. Impulsive actions and panic occurred in some cases.

Sargent and Blackburn [37] reported that 46 mentally disordered patients showed an average increase of eight per cent in the response to Cattel's Intelligence Tests after benzedrine sulfate, with schizophrenics exhibiting only half the response of patients with anxiety states, depression or hysteria. Molitch and Sullivan [38] found the performance of 50 boys on the New Stanford Achievement Test improved in 96 per cent after benzedrine sulfate. Molitch and Eccles [39] found improved performance in 93 boys following benzedrine sulfate in tests of the strength of grip (Smedley dynameter), motor coordination (Witmer form board test), memory for designs (reproduction of card designs), and one of three highly standardized intelligence tests (Kent E. G. Y., Morgan, and Kuhlman-Anderson). Bradley [40] observed improvement in school performance in half of 30 behavior problem children given benzedrine sulfate. A large proportion became emotionally subdued (from the stimulated cortical inhibition of lower center reactions) without, however, losing interest in their surroundings.

In our experience, persons with inherently low mental levels showed little alteration in intelligence scores after benzedrine sulfate, although patients with early toxic or infectious psychoses were apt to increase their rating as the abnormal mental state cleared. We observed more elaboration of detail on the Rorschach test in two cases who had received benzedrine sulfate.

Thorner and Yaskin [41] reported a more satisfactory response to a combination of benzedrine sulfate and prostigmin than to either drug alone in three cases of myasthenia gravis.

CONCLUSIONS.

1. During a period of 18 months benzedrine sulfate has been administered to 145 patients with psychiatric conditions including organic psychoses, functional psychoses and psychoneuroses as

well as to a number of non-psychotic individuals with organic disease and to normal persons. Longer continued observations of a larger series of patients correlated with adequate control studies will be necessary before we can determine the exact value of the drug.

2. Investigations to date indicate that the drug has a place in the treatment of certain forms of mental illness and merits further study.

3. Benzedrine sulfate is of greater benefit in certain of the organic psychoses than in the functional states or psychoneuroses. In the psychoses, benzedrine sulfate appears to be of value in those cases of recent onset due to intoxication, particularly alcohol; to be of some benefit in the psychoses of recent onset due to infection and trauma; and to be of limited usefulness in the self-absorbed schizophrenic states of recent onset. In organic non-psychotic conditions of psychiatric interest the drug appears to be of most value in narcolepsy, of considerable worth in acute alcoholism, and of some usefulness in postencephalitic Parkinsonism.

4. Benzedrine sulfate appears to be of greater value in organic states where no psychosis coexists and where deterioration or personality alterations are minimal and non-progressive.

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DISCUSSION.

DR. ALEXANDER SIMON (Washington, D. C.).—In these days when pharmacologic therapy is so fashionable in the treatment of mental illness, the value of benzedrine sulphate has been somewhat overshadowed by the more spectacular forms of hypoglycemic and metrazol shock therapy. This is to be regretted as benzedrine should have a very definite place in the therapeutic armamentarium of the psychiatrist.

Its particular value lies not so much in the cure of any specific psychiatric entity as in the amelioration of certain symptoms which may make the patient more comfortable and more accessible to psychotherapy.

Of its value in the acute toxic cases, Dr. Davidoff's presentation can leave little doubt. I seriously doubt, though, that benzedrine in itself can materially lessen the course of illness in dementia precox or manic-depressive psychosis. Unquestionably it may have a striking effect in ameliorating certain symptoms that have been labeled by some as "nervous exhaustion"—symptoms such as lack of energy, a tired, exhausted feeling and mild depression. While benzedrine may have a beneficial effect on these symptoms, the effect is only temporary and the principal therapeutic attack must be leveled at the basic psychoneurosis of which these symptoms are a partial exression.

In our own experience the drug has been found particularly useful in decreasing the frequency of narcoleptic attacks and in decreasing the rigidity and tremor and the frequency of oculogyric crises in postencephalitics. Our experience has been that there is little appreciable effect upon the course of the illness of the dementia precox or manic-depressive patient, although one may observe temporary improvements in speech, motor activity and accessibility; on the whole, the basic psychotic reaction remains unchanged.

In the deeper depressions the drug usually has little or no effect and where tension, restlessness, agitation and irritability are prominent symptoms, it is definitely contraindicated.

In the milder depressions, especially in those in which diurnal variation in mood and activity is present, the morning dose of benzedrine may be sufficient to dissipate the depression and retardation commonly present during the early part of the day.

It is too optimistic to hope that benzedrine may overcome the alcoholic habit, but where the alcoholism is secondary to mild depression, benzedrine by substitution may help dissipate the tendency to alcoholism.

One must constantly be on guard for the occasional case which suddenly passes from a depression to manic excitement or from catatonic stupor to catatonic excitement after only a few doses of benzedrine, but I know of no way by which this can be predicted.

The one condition for which the drug can be most heartily recommended, and perhaps some members of this audience can make use of it, is for the hangover which comes the morning after the night before.

FATAL CASES OF ACUTE MANIC-DEPRESSIVE PSYCHOSIS.*

By CHARLES P. LARSON, M. D., C. M.

A thorough review of the medical literature relative to acute manic-depressive psychosis fails to reveal the cause of the high mortality existing in this potentially recoverable psychosis. In the older literature these cases were referred to as acute delirious mania, or specific febrile delirium;[1] more recently they have been classified as acute manic-depressive psychosis with exhaustion syndrome. They differ from secondary febrile delirium in that there are no physical signs of an acute specific fever with rash, sore throat, and positive physical findings in the thorax or abdomen, but merely a high temperature with violent delirium. Acute delirious mania is the commonest cause of death in manic depressives. However, it is not limited to this group of mental disease, having also appeared in schizophrenics. Derby[2] in a survey of 386 deaths in manic-depressive patients at the Brooklyn State Hospital attributed 48 per cent of these to the exhaustion syndrome. In the Western Washington State Mental Hospital, during the years 1936-37, a comparative figure of 52 per cent was obtained. In this latter group there was an equal sex distribution and 50 per cent of the cases were below 35 years of age.

The prodromal period was always short, often only a few hours, being characterized by malaise, anorexia, headache, insomnia, physical and mental irritability which gradually merged into a wildly delirious state. The symptoms may then be divided into mental and physical as follows: Mental; confusion, complete disorientation, rapidly-changing hallucinations, irrationality and ideas totally devoid of sequence. Cardinal among the physical symptoms and present in every case were increased psychomotor activity, in-

* Read at the ninety-fourth annual meeting of The American Psychiatric Association, San Francisco, Calif., June 6-10, 1938.

From the pathological departments of the Western State Hospital, Fort Steilacoom, Wash., and the Pierce County General Hospital, Tacoma, Wash.

somnia, dehydration, fatigue and elevation of temperature. Physical symptoms were progressive in nature and increased rapidly in severity. The dehydration, symptomatic plethora and cyanosis were the result of low fluid intake, sweating, vomiting and occasionally diarrhœa. The temperature was of the septic type, reaching as high as 110° F., with a tendency to drop in the terminal stages. The pulse was very rapid and the blood pressure often reduced. Laboratory findings included leucocytosis, symptomatic plethora, low blood chlorides, slightly elevated blood urea nitrogen, albuminuria and low chloride excretion in the urine. Leucocytosis varied from 15,000 to 35,000, being polymorphonuclear in type. Whole blood chlorides ranged from 100 to 400 mgs. per 100 c. c. of blood. Plasma chlorides showed a similar depression. Urine chloride excretion in 24-hour specimens was very low. The patient's condition deepened to exhaustion and circulatory collapse developed suddenly. Neurological symptoms such as muscular twitchings, spasms and bizarre paralyses were observed in the terminal stages of the disease. Seventy-five per cent of the cases died within two weeks of the date of onset, many of them in a few days.

This report was based upon 14 fatal cases which were thoroughly analyzed both as to clinical course and post mortem findings. The commonest autopsy findings were marked post mortem lividity, dehydration, petechial hæmorrhages in the brain, pulmonary œdema and evidences of circulatory collapse. Marked dehydration and petechiæ into the midbrain and hypothalamic region were present in every case. The abdominal, pericardial and pleural cavities were dry, and there was a relative decrease in subarachnoidal fluid. The petechiæ were widely scattered throughout the midbrain and hypothalamic region, chiefly localized in the nuclei about the aqueduct of Sylvius, nuclei superior and lateral to the wall of the third ventricle, caudate nucleus, nucleus subthalamicus, lenticular nucleus and thalmus. In three cases cortical petechiæ were present. (Diagram 1 shows relative frequency of sites of hæmorrhages.) These hæmorrhages were situated perivascularly (Figs. 1-2), surrounding either capillaries or tiny arterioles. There was destruction of adjacent cerebral tissue. The absence of blood hemolysis and ameboid glial-cell reaction indicated that the lesions were of recent origin. Proximal nerve cells were in varying stages of degeneration and metallic stains demonstrated commencing glial reaction.

FIG. 1.—Perivascular Type of Petechial Hæmorrhage.

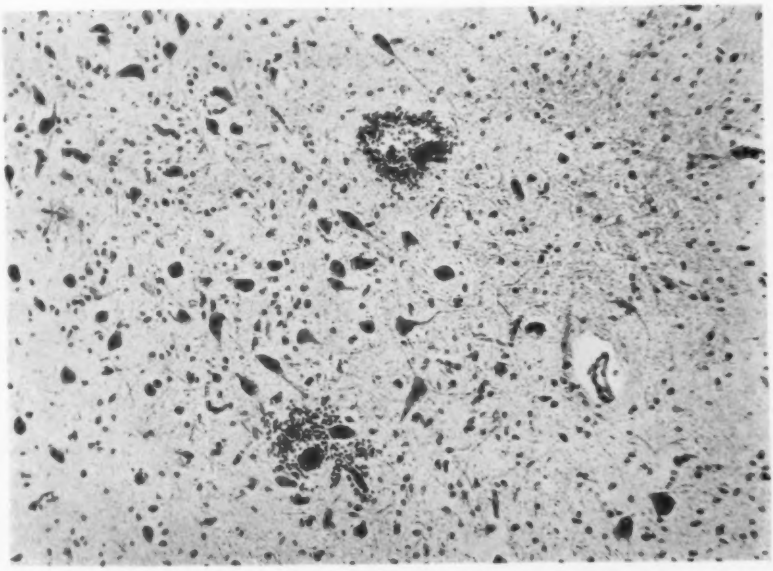

FIG. 2.—Petechial Hæmorrhages in Midbrain.

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Terminal pulmonary œdema was present in 11 of the 14 cases. As destructive brain lesions always lead to œdema, or more serious pulmonary complications, the œdema in these cases may be ascribed to the cerebral pathology. Acute passive hyperæmia of skin vessels, cerebral veins, abdominal and thoracic organs, together with right-sided cardiac dilatation, were evidences of terminal myocardial failure.

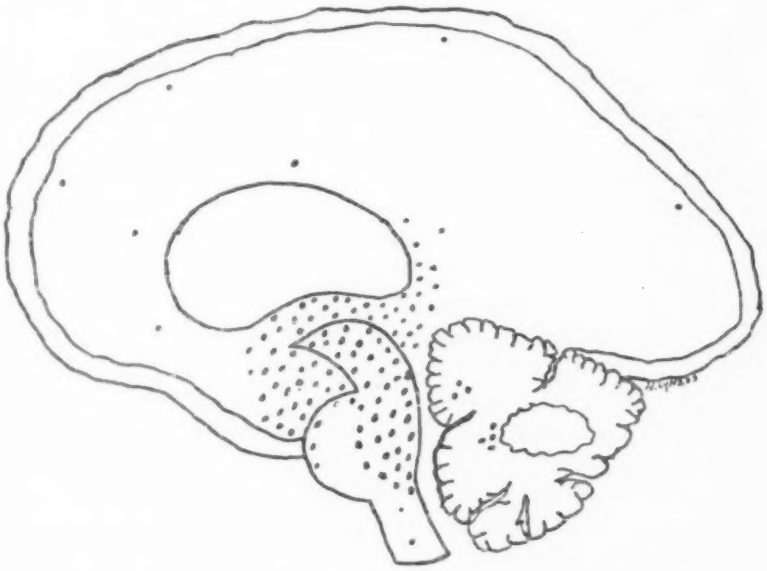

DIAGRAM 1.—Dots Indicate Sites of Hæmorrhage.

DISCUSSION.

For several years French, German and Italian investigators have recognized chlorine disturbances of the body as a distinct clinical entity. Normal whole-blood chloride estimates vary somewhat, depending upon the method used in determination and with the author quoting the same. Gradwohl,[3] using the Volhard-Arnold Method, gives the normal as 600 to 800 mgs. per 100 c. c. of blood, while Todd and Sanford,[4] using the method of Wilson and Ball, place the normal figure at 450 to 500 mgs. per 100 c. c. of whole blood, and March [5] places the whole blood figure at 494 mgs. Plasma chloride determinations average about 100 mgs. higher.[6] The nor-

mal intake of sodium chloride per day varies from 8 to 20 grams. A corresponding amount is excreted by way of the stomach, intestines, skin and kidneys. When water is lost from the body the salt is also depleted; hence, dehydration leads to hypochloræmia.[7] Perspiration may contain as high as .6 per cent sodium chloride and, in event of excessive fluid loss by this means, 6 to 8 grams of salt may be lost per hour.[8, 9, 10] Continuous vomiting or diarrhœa leads to severe chloride loss which may terminate in coma and circulatory collapse.[11]

There is a striking similarity between the physical symptoms, laboratory and autopsy findings of acute delirious mania, and other conditions in which hypochloræmia is a common factor. Heat prostration (heat stroke or heat cramps), is an excellent example of this similarity. Cardinal symptoms of heat stroke are rapid pulse, low blood pressure, elevation of temperature and dehydration, all deepening to a state of exhaustion. There is a diminution of the blood chlorides, increase in blood non-protein nitrogen, albuminuria and low urine chloride excretion. The same complications of pulmonary œdema, exhaustion and circulatory collapse are present in fatal cases of both heat prostration and acute delirious mania. Autopsies performed on patients dying from heat stroke disclosed generalized dehydration, and petechial hæmorrhages in the brain.[12, 13] A milder degree of hypochloræmic symptoms have been observed in individuals receiving the salt privation treatment for hypertension advocated by Dr. Frederick M. Allen.[14] Other well-known hypochloræmic syndromes with similar symptoms, laboratory and autopsy findings, are cholera,[15] pyloric stenosis of infants, acute upper intestinal obstruction without loss of blood supply to the bowel wall and extensive burns.[16] Low blood pressure, dehydration and fatigue, deepening to exhaustion, are symptoms common to all hypochloræmic conditions.

After exercise the blood pressure rises to support the muscular activity and to aid heat dissipation by a more adequate peripheral circulation.[8, 17, 18, 19, 20, 21] With profuse perspiration there is excessive loss of chlorides. One obvious result of this excessive loss of salt and water is to lower the blood volume, thus producing a condition almost identical with hæmorrhage and surgical shock. Fatigue is due to the inability of the circulatory system to maintain an adequate blood pressure in the nerve centers.[22] The sense of

well being depends largely upon a constant blood pressure and unconsciousness may be produced by a sudden drop of the same. Fatigue and exhaustion are the direct result of dehydration and fall of total blood volume. Cyanosis often appears under these conditions, and this has led to the false impression that the heart was laboring against a blood plethora, whereas the true state of affairs is a cardiac oligæmia because much of the blood has been attracted to the surface of the body to accommodate for the normal process of perspiration and evaporation. The depleted blood supply is being used for the desperate need of cooling the body from the heat which is destroying it.

With a knowledge of the foregoing facts let us trace the course of events in a case of acute delirious mania. The initial factor is, of course, a mental one in which the patient becomes irritable, disturbed, sleepless, and finally wildly delirious. Psychomotor activity increases, which leads to sweating. Complete refusal of food and fluid together with sweating, and in some cases vomiting and diarrhœa, produces severe dehydration. Whenever fluids are lost there is a corresponding loss of chlorides. Hypochloræmia plus dehydration produce the other symptoms; namely, elevation of temperature, low blood pressure, cyanosis, fatigue and exhaustion. The mental symptoms are aggrevated by the disarrangement of the blood chemistry and hence a vicious circle is established. The factor producing the petechial brain hæmorrhages is in all probability the hypochloræmia. The intercellular substance between the endothelium of capillaries contains a high proportion of chlorides.[23] Hæmorrhage by diapedesis seems to be associated with chemical changes in the capillary walls.[24] A decrease in the amount or a difference in the method of combination of the chlorides in the intercellular substance of the endothelial cells may permit the escape of red blood cells from the lumena. Why the vital areas of the midbrain and basal ganglia should selectively be the site for these petechial hæmorrhages can no more be explained than can the reason why certain other portions of the central nervous system should be selectively injured in such diseases as anterior poliomyelitis or rabies. Death may be explained on a basis of these hæmorrhages. The anatomical location of these petechiæ corresponds very closely to the so-called "Duret's Hæmorrhages" in cases of pure concus-

sion of the brain. The circulatory, respiratory and vasoconstrictor centers are all situated near the floor of the fourth ventricle. Hence this area might be termed the locus minoris resistantiæ of the brain, and even small lesions in this region are capable of producing a rapidly fatal outcome.[25] The heat regulating mechanism has been localized to the rostral part of the lateral hypothalmus.[26] Experimental lesions in this area have produced a temporary rise in body temperature, followed by a decline which reaches several degrees below normal. Therefore, petechial hæmorrhages in this area may have accounted for the terminal fall of temperature observed in some of the cases upon which this report is based.

The treatment for these cases is specific and the results are very often quite dramatic. It consists of raising the blood chloride level to normal and relieving the dehydration. Continuous intravenous normal saline administration will in some instances accomplish both purposes. Very often, however, it will be found necessary to introduce hypertonic saline to raise the chloride level to normal. Two to three thousand c. c. of normal saline should be given the first 24 hours, the amount of course depending upon the degree of dehydration, the general condition of the patient and the individual tolerance to fluid administration. Fluids by mouth would be ideal, but individuals in the acute stage of this disease almost invariably refuse oral medication. The drinking of salty solutions will often produce emesis, thus increasing the chloride loss. The technical difficulties encountered in maintaining a continuous intravenous flow in a wildly delirious patient may readily be appreciated. Hypodermoclysis will accomplish the same objective, eliminating the technical difficulties of the intravenous method. Close supervision during the period of excessive fluid administration is necessary as pulmonary œdema and cardiac dilatation are possible complications. These complications have not occurred in any of the cases observed by the author. A more rapid elevation of the blood chloride level may be accomplished by injecting either 40 c. c. of a 5 per cent sodium chloride solution or 20 c. c. of a 10 per cent solution. These hypertonic solutions do not produce an immediate harmful diuresis because of the dehydration present. Several injections of this hypertonic solution per day are indicated when the blood chloride level is below 200 mgs. per 100 c. c. of whole blood. The addition of

glucose to the solutions has no specific value, but it does improve the general condition of the patient by lessening the degree of exhaustion. Theoretically glucose would also serve to avert the complication of circulatory collapse.

Producing sedation in these individuals becomes a problem as they are unusually resistant to the action of sedatives. A combination of hyoscine and apomorphine (1/100 gr. hyoscine to 1/20 gr. apomorphine per 1 c. c. of solution), has proven to be a very effective sedative. The emetic action of the apomorphine seems to be almost entirely eliminated when given in combination with the hyoscine. Fifteen minims of this solution will produce complete rest within a few minutes. This dose is sufficient to maintain somnolence for a period varying from three to eight hours. Ten minims may be repeated in four hours with no harmful cumulative effect. The commonly used barbiturate sedatives may be used as supplimentary measures. In the author's experience, continuous hot baths or tepid packs are contraindicated, as they have produced symptoms of acute cardiac failure. Derby [2] has had the same experience and states that these hydrotherapeutic measures are faulty treatment. Stimulants are only indicated when there is a severe depression of the circulation or respiration.

Since the foregoing treatment was instituted as a routine procedure nine consecutive cases of acute delirious mania have been treated without a single fatality. Three were admitted in a stuporous, exhausted, terminal state, with a chloride level below 150 mgs. per 100 c. c. of whole blood. The immediate effects of the treatment have been to relieve the exhaustion, improve the general physical condition, and lessen the severity of the delirium. Two of the cases returned to a relatively normal mental status within 48 hours; the remaining seven ran a subsequent course characteristic of manic-depressive psychosis (manic type), without the acutely delirious features. In one case there was a relapse into the acute delirious state, which was in turn controlled by the same treatment.

SUMMARY.

An analysis of the physical and mental symptoms and laboratory findings in 14 cases of fatal acute manic-depressive psychosis has been presented. Essential features were: dehydration and hypo-

chloræmia. Autopsy revealed petechial hæmorrhages into the vital areas of the brain. These hæmorrhages are considered to be secondary to the hypochloræmia, and are the immediate cause of death. Treatment is specific and consists of combating the dehydration and raising the blood chloride level to normal. Nine consecutive cases have been treated with the method described and not a single fatality resulted.

The need for research into the cause for the high mortality in cases of acute manic-depressive psychosis, which is a potentially recoverable condition, has been very great. It is hoped that this work will be corroberated by other investigators, and that it may pave the way to materially lower the mortality in these cases.

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DISCUSSION.

Dr. Henry I. Klopp (Allentown, Pa.).—*Mr. Chairman, Ladies and Gentlemen:* Authorities such as White, Diefendorf, Church and Peterson all consider acute delirious manis a very rare disorder, described as invariably fatal. In this respect, from my more than forty years of experience, I concur.

White states: "It is probable, however, that it was more usually an acute psychosis associated with some serious though often unrecognized condition of the internal organs." The more recent textbooks such as Noyes and Strecker and Ebaugh do not describe this condition.

Two previous papers upon this subject have been read before this organization. One was entitled "The Pathology of Acute Delirium," by Dr. H. A. Tomlinson, then superintendent of St. Peters State Hospital, St. Peter, Minnesota, and was read at the fifty-ninth annual meeting in Washington, D. C., in May 1903, and appears in volume X of the *Transactions.*

In this paper the statement is made: "Where the delirium is the first apparent manifestation of the mental disturbance, a careful study of the history of the patient has disclosed conditions in his physical and mental status which have brought about exhaustion of the nervous system alone, with auto-intoxication or some form of general sepsis as a concomitant."

During eight years, Tomlinson had twelve men and eleven women suffering from acute delirious mania. In studying serial sections from patients dying

in delirium, he found the number of elements involved was relatively great, and the degree of involvement more extreme than in other psychoses, even in extreme cases of dementia, and that the change was destructive rather than degenerative.

In order to determine the significance of the differences and the extent of the destruction possible, a series of experiments with rats was undertaken. After establishing normal standards, a rat was put into a whirligig of a squirrel cage and kept in motion until partially exhausted. It was then killed, and the cortex of the brain studied. Another rat was then put through the same process for a longer period with intervals of rest. Finally, with others, they supplied as nearly as possible the conditions present in acute delirium—insomnia, starvation and constant motion, death resulting from exhaustion. The resulting changes were found to be exactly the same as those occurring in the human brain as a result of a similar exhaustion from disease. The paper is illustrated, showing the normal and the histological changes in the brain in delirium and in the experiments on rats.

In the July 1934 issue of the AMERICAN JOURNAL OF PSYCHIATRY, appears the second paper entitled "Bell's Mania," or acute delirium, by Dr. S. H. Kraines, Chicago. In his introduction he states: "There is a group of cases of acute psychoses that has been described by several observers, and yet has been quite neglected."

He called attention to the fact that these cases were first described by Luther Bell in 1849. He quotes Bell's words and his description of the disease: "On inquiry of the invasion of the attack, you will find that it came suddenly, 'about a week since,' frequently, indeed, by a sudden outbreak," and also quotes his eight peculiarities of the disease.

A survey of the literature reveals that there are several names for this clinical syndrome such as "Bell's mania," "typhomania," "delirium grave," "acute delirious mania," "acute delirium," and "collapse delirium."

The general tendency has been to place these cases in the manic-depressive group, or in the toxic-infectious-exhaustive group. Dr. Kraines states: "Regardless of the general classification, the disease stands out as a clinical syndrome." He suggests that these cases be called "Bell's mania," after the original observer.

Dr. Larson is to be complimented upon his scientific study of his cases, first of his fourteen fatal cases which he thoroughly analyzed both as to clinical course and post-mortem findings, and especially his deduction that the true state of affairs in his cases was a cardiac oligaemia with severe dehydration and hypochloræmia producing petechial brain hemorrhages and resulting in death. We are indebted to Dr. Larson for the detailed outline of his successful so-called specific treatment in nine cases through the administration of normal saline solution either intravenously or by hypodermoclysis; in like manner his effective sedation treatment. Dr. Kraines in his paper states: "In our case ordinary sedatives failed, and though over 125 grains of sodium amytal were given in three days, the patient slept comparatively little.

I would urge upon the members of this association to study the chloride content of the blood in all cases showing symptoms of Bell's Mania (acute delirium) in order to test further the saline treatment which Dr. Larson has found so successful.

DR. H. S. GREGORY (Binghampton, N. Y.).—I would like to compliment Dr. Larson on the presentation of a subject that has bothered all of us, and to say that I have seen some cases which I fear resemble clinically the doctor's group, and yet fundamentally are not of that type, which are apt to be confused if one does not resort to blood chemical studies.

We see cases due to other etiology with acute attacks of febrile delirium which we would, if we were not to make the blood chemical study, after hearing Dr. Larson's paper, classify with his low chloride group. We must not be too enthusiastic and without careful study include cases with high temperature in that category unless we have supporting evidence.

Not infrequently one sees cases of this type that do drink water and eat a fair amount of food, and still run the syndrome described today. We must not take it for granted that the whole problem is solved, and we must study our cases critically.

DR. LLOYD H. ZIEGLER (Wauwatosa, Wisc.).—This is a very interesting syndrome, and Dr. Larson has done credit to it. I have had personal experience with a number of these cases, 15 or 18 cases within the last ten years, some of which were fatal and some of which survived.

They seem to be characterized by one thing which I feel should be emphasized, and that is a certain type of over-activity. We had one person who nearly died, but who survived, whose hands and legs were relatively still but who talked all the time. He talked in spite of anything we tried to do, and we felt that his use of the respiratory muscles was perhaps a factor that introduced some problems in physiology that were different from the use of the biceps. I think Dr. Larson has done something to help us in that connection.

We had one case with a swollen lip that made us feel we were dealing with Pinkin's disease and that the brain was congested, and it was apparently swollen. The pathologist could not help us very much in establishing Pinkin's disease of the brain. We also made a study of chloride, the patient did not sweat very much but had a temperature of 107. There are still questions to be answered, and while Dr. Larson has covered many factors in this syndrome I feel that there are some it would be well to look into further.

DR. J. F. BATEMAN (Columbus, Ohio).—It seems to me Dr. Larson has discussed two entirely different types of cases.

In his first group he begins by giving the pathology of what seems to be mid-brain disease. Then his discussion is that of metabolism. Those cases which recovered, in all probability did not have evidence of mid-brain disease,

as I understood the matter, whereas mid-brain pathology in all those that died was evident.

If this mid-brain pathology existed, may I ask Dr. Larson if there was any evidence of cranial, autonomic inhibition that might be associated clinically with mid-brain disease. That is to say, any changes in pupils, any changes in the pulse rate in the early course of the disease.

I would like also to ask if there was any evidence of previous mental disturbance in the patients who died, thinking that these might be what some of us have tried to describe as the schizophrenic reaction type which has an etiology unknown but with evidence of mid-brain disease.

In short, I am interpreting this paper as describing two entirely different types, one which might be that unknown which we all deal with and which does have mid-brain disease; the other the acute manics which are treatable and recoverable by the method which Dr. Larson has described.

Dr. Charles P. Larson (Closing).—I do not believe that this little problem that I have worked out here in any way solves all of the problems of the disease.

In regard to the last gentleman's question as to previous mental disease, most of these individuals were young and in their first attack of mental disease; but when they were admitted to the State Hospital they were generally in an advanced stage of the disease.

In no instance that I remember except one was there evidence of a previous attack, either of this or any other type of psychosis. In one of these cases there was a history of a previous attack which was regarded as being of a similar type—that is, of an acutely delirious state. The brain in this case was unusually interesting. I did not bring this into the discussion, but on sectioning the basal ganglia I found multiple sand-like concretions.

With regard to the question whether we are dealing here with two entirely different conditions, I may say that I cannot correlate the clinical syndrome with the findings at autopsy on these fatal cases. However, it is my opinion—and this is only an opinion which has to be substantiated by others who have worked on hypochloremia—that this is apt to produce hemorrhage and perhaps in the cases that recovered the hemorrhage never occurred. That is the only answer I can give.

It is possible that not all these cases should be classified as Bell's Mania, which at best is not a very satisfactory classification. I think we should regard these as acutely delirious psychoses, a type of psychosis that is unclassifiable, at least until after the acutely delirious features are over, until we find an organic cause and are able to classify them as such rather than non-organic.

Comment.

DEDICATION OF THE NEW HOSPITAL FOR DRUG ADDICTS.

The second United States Public Health Service hospital for the treatment of drug addicts was dedicated at Fort Worth, Texas, on October 28, 1938. The first hospital of this type, located at Lexington, Kentucky, was opened in 1935. The two institutions, when completed, will have a capacity of about 2400 patients, which will be adequate to take care of all male convicted federal addict prisoners, in addition to voluntary male addicts who wish to be treated in a government institution.

The present capacity of the Fort Worth hospital is 285 beds, but this will be increased within the year to 1000. The hospital is located on a 1400-acre tract about four miles from Fort Worth. The completed portion of the institution is composed of an attractive group of two-storey brick buildings, of Spanish mission style, arranged in the form of a quadrangle. A four-storey building to accommodate 715 patients will be located just outside of this quadrangle, but will be connected with the other buildings by a tunnel. The institution has all the facilities of a modern hospital, plus certain industrial activities designed to provide work of a constructive nature for prisoners, as well as voluntary patients.

The hospital is organized along the lines of modern mental hospitals. The Medical Officer in Charge, Passed Assistant Surgeon William F. Ossenfort, has had wide experience in the treatment of drug addicts. He will have to assist him an executive officer, a clinical director, staff physicians, dentists, a psychologist, a librarian, a laboratory technician, trained nurses and other personnel in generous proportions. Prisoners will be treated here, but the atmosphere will be that of a hospital, with the custodial factor reduced to a minimum. The most difficult cases will be taken care of at the Lexington hospital, so that the maximum amount of liberty and responsibility may be given to patients treated at Fort Worth, this being considered good therapy for drug addicts.

Surgeon General Thomas Parran delivered the dedication address. He traced the history of drug addiction from ancient to modern times, paying special attention to the development of the federal program of treatment, whereby convicted addicts are to be treated in hospitals rather than in prisons. He also pointed out the necessity for research, not only in drug addiction, but in other phases of the mental hygiene problem.

PSYCHIATRIC PROGRESS IN CALIFORNIA.

The progressive outlook of psychiatry in California from the standpoints both of scientific advance and of improved facilities for the treatment of the mentally ill, was appreciatively recognized by the members of the Association who attended the recent annual meeting in San Francisco. This outlook was reflected in numerous contributions by Californians.

It is now possible to report the gratifying news that Dr. Aaron J. Rosanoff has been appointed director of institutions of the State of California by the Hon. Culbert S. Olson, who took office as Governor, January 1, 1939. By this act of placing in a position of such wide authority a psychiatrist of Dr. Rosanoff's standing California's place seems assured among the progressive states in which scientific psychiatry is encouraged, the welfare of patients held paramount, and where suitable administrative procedures are not nullified by political interference.

A preliminary survey of the institutions which are under the jurisdiction of the Department, reveals that the largest and most urgent problem is that of overcrowding. Not only must immediate steps be taken to meet this situation, but the possibility of a more effective policy for dealing with the problem in the future must be considered.

New construction to cost more than $8,000,000 has already been provided for in the budget to be submitted to the 1939 session of the California legislature. In addition Dr. Rosanoff has recommended to the Governor the establishment of a psychiatric clinic for acute cases in San Francisco, and later a similar one in Los Angeles. He also urges substantial expansion of the social service

activities of the Department with a view to the gradual development of extramural care on an extensive scale.

The work of Dr. Rosanoff will be watched with the greatest interest, and it is anticipated that he will receive the full support of the government. Governor Olson, the hospital services and the people of California are to be congratulated upon this appointment.

News and Notes.

AMERICAN ORTHOPSYCHIATRIC ASSOCIATION MEETING.—The sixteenth annual meeting of The American Orthopsychiatric Association, an organization for the study and treatment of behavior and its disorders, will be held at the Commodore Hotel, Lexington Avenue and 42d Street, New York, N. Y., on February 23, 24 and 25, 1939. Dr. Norvelle C. LaMar, Secretary, 149 East 73d Street, New York, N. Y.

MICHIGAN RAISES QUALIFICATIONS OF STATE HOSPITAL SUPERINTENDENTS.—Dr. Joseph E. Barrett, director of the State Hospital Commission in Michigan, announces the adoption by the Commission of a standard requiring that all superintendents of state mental hospitals appointed in the future shall be diplomates of the American Board of Psychiatry and Neurology. This is a noteworthy advance in administrative policy. It will be recalled that a similar provision was included in the new act governing mental hospitals in Massachusetts. A precedent is thus established which will demand the serious consideration of other state governments.

PHILADELPHIA POSTGRADUATE INSTITUTE.—The Philadelphia County Medical Society announces the completion of its scientific program for the Fourth Annual Postgraduate Institute, to be held in the Bellevue-Stratford Hotel, Philadelphia, during the week beginning March 13, 1939. The subjects to be considered are those embraced by the terms blood dyscrasias and metabolic disorders. These will be further subdivided for convenience in instruction into 86 clinical lectures, with open forum discussion for each topic, delivered by as many individual specialists of national distinction.

The pre-eminent position of Philadelphia as a medical center in the past has been justified by its large array of first class hospitals and contributory institutions, and that conservative scholastic atmosphere so essential to careful and dependable research.

Despite the development of medical centers in other areas, Philadelphia has continued to maintain its enviable position and it has been the desire of the Philadelphia County Medical Society to release to its own members and to those of the medical profession in general, the results of the labors so diligently conducted within the walls of the city's several medical schools.

This purpose the Postgraduate Institute aims to serve and a program of exceptional interest is promised.

Address all inquiries to the Philadelphia County Medical Society, Twenty-first and Spruce Streets, Philadelphia.

DR. RILEY H. GUTHRIE GOES TO SAINT ELIZABETHS HOSPITAL. —The appointment of Dr. Riley H. Guthrie, chief executive officer of the Boston Psychopathic Hospital, to the position of first assistant physician at Saint Elizabeths Hospital, Washington, D. C., has been announced by Dr. Winfred Overholser, superintendent of the Hospital. Dr. Guthrie was born in Smithville, Arkansas, in 1895, attended the University of Arkansas and received the degree of Doctor of Medicine from the University of Tennessee School of Medicine, as sixth in his class, in 1921. He served on the staff of the State Hospital at Little Rock, Arkansas, for three years, spent two years in private practice, and then resumed institutional work as assistant physician at the State Hospital at Massillon, Ohio. Following this he was appointed medical officer at the Boston Psychopathic Hospital, serving for one year, and for six years thereafter was assistant superintendent of the Monson State Hospital at Palmer, Massachusetts. In June 1935 he was appointed assistant to the Commissioner of Mental Diseases of Massachusetts and in November of the same year chief executive officer of the Boston Psychopathic Hospital. Dr. Guthrie is a member of the American Medical Association, the American Psychiatric Association, the Massachusetts Psychiatric Society, the New England Society of Psychiatry, the Boston Society of Psychiatry and Neurology, the American Association for the Advancement of Science, and the International League Against Epilepsy. He is a diplomate of the American Board of Psychiatry and Neurology, and has contributed extensively to the literature of psychiatry. In a recent country-wide competitive examination held by the U. S. Civil Service Commission he received the highest rating given.

CORRECTION A. P. A. DIRECTORY.—Attention is drawn to an error in the 1938-39 List of Fellows and Members of The American Psychiatric Association, through which the address of Dr. Carl P. Wagner, physician in charge, Elmcrest Manor, is shown as Portland, Oregon. The correct address of Dr. Wagner is Elmcrest Manor, 25 Marlborough St., Portland, Connecticut.

RORSCHACH COURSE.—A course in the application of the Rorschach method will be offered by Dr. S. J. Beck at Michael Reese Hospital, Chicago, Illinois, May 15-20, 1939, *i. e.*, the week following the annual convention of the American Psychiatric Association.

Tentative plans are also being made for a similar ten-day course to be offered later in the summer. The dates will be arranged to meet the convenience of prospective registrants. Interested persons having preferences as to date are invited to communicate with the Librarian, Michael Reese Hospital.

KENTUCKY PSYCHIATRIC ASSOCIATION.—Under the presidency of Dr. Isham Kimball of Lexington, the second annual meeting of the Kentucky Psychiatric Association was held at the Hotel Phoenix, Lexington, Ky., December 9 and 10, 1938. There were three scientific sessions and one administrative session; the meetings were well attended and the program indicates the progressive attitude of the leaders in psychiatry and mental hygiene in Kentucky.

The officers for the coming year are: Dr. Spafford Ackerly, Louisville, president; Dr. F. K. Foley, Lexington, president-elect; Dr. L. M. Rogers, Lexington, vice-president; Dr. Robert H. Felix, Lexington, secretary-treasurer.

Two members of the Council were elected as follows: Dr. John R. Peters, Pewee Valley, and Dr. S. D. Vestermark, Lexington. Councillors retaining office for another year are: Dr. W. E. Gardner, Louisville, and Dr. L. E. Trent, Lexington.

INCIDENCE OF MENTAL DISEASE.—Public Health Reports for November 11, 1938, contains an interesting article on The Incidence and Future Expectancy of Mental Disease (53: 2004). Following is the summary.

It is commonly believed that there has been an alarming increase in mental disease in recent years and that this is in large part the direct result of the stress and strain of a complex urban environment.

Analysis of the number of first admissions to mental hospitals in Massachusetts, New York and Illinois does not bear out this belief. The number of first admissions per 100,000 population decreased among women 70 years of age in each state. In Massachusetts the same was true for men. In New York and Illinois commitment rates decreased at the younger ages, but after age 45 or 50 some increase occurred.

Even though the incidence of mental disease has not been increasing as rapidly as commonly supposed, nevertheless mental diseases constitute a major health problem. Unless there is a decrease in the first admission rates to mental hospitals, from 110,000 to 120,000 of the 2,144,800 infants born during 1936 will eventually be committed to a hospital for mental disease. This number includes only the most severe cases of mental illness and excludes a large number of emotionally unstable and unbalanced persons who should be included in a comprehensive mental hygiene program.

Owing to the increasing proportion of the population in the older age groups, an increase in the number of admissions to mental hospitals is to be expected in the future, since rates of mental disease are highest at the older ages. A continued increase in expectation of life will also tend to increase the number of mentally ill, since more persons will live to the ages when mental disease is most frequent. Assuming that the commitment rates for mental disease for the total United States are no greater in 1960 than they were in New York State during the 3-year period 1929-31, it is estimated that about 135,000 persons annually will be committed to a mental hospital for the first time. This is nearly twice the present number of first commitments.

It is believed that one factor has not been considered in the above research. Since 1929, and the depression, many senile cases

have been committed to hospitals who previously had been kept at home. Reduced incomes made such admissions necessary, together with the need for families to move into smaller living quarters because of reduction in income. This might account for a part of the increase of first admissions of the older ages.

MEDICAL SOCIETY OF ST. ELIZABETHS HOSPITAL.—The Society will hold its second annual meeting in Washington, D. C., on April 14, 1939. Members of the Society will be luncheon guests of Dr. Winfred Overholser, superintendent, on that date. The afternoon will be devoted to the presentation of papers describing research interests of members of the Society; in the evening, there will be a dinner at a Washington hotel. Dr. C. Macfie Campbell, director of the Boston Psychopathic Hospital and professor of psychiatry at the Harvard Medical School, and Dr. Riley H. Guthrie, newly-appointed first assistant physician at St. Elizabeths Hospital, will be guests of the Society. The chairman of arrangements is Dr. S. Katzenelbogen, St. Elizabeths Hospital, Washington, D. C., from whom further details may be obtained.

INDEX—REVISTA IBERO-AMERICANA DE ANALISIS BIBLIOGRAFICOS DE NEUROLOGIA Y PSIQUIATRIA.—This new review published in Buenos Aires, made its appearance in July 1938. It is issued bi-monthly and proposes to bring together in short reviews contributions in neurology, psychiatry and related disciplines by Latin American authors. It will also publish from time to time extended summaries of important contributions on subjects of current interest.

In each of the divisions under which the material reviewed is classified there are also listed the titles of relevant articles published in the United States.

The text throughout is in Spanish but each title is also given an English translation.

Index appears under the editorial direction of Dr. Roque Orlando with the collaboration of Drs. E. E. Krapf, B. A. Moyano and Dr. H. M. Piñero. The publication office is Maipu 827, Buenos Aires (R. A.).

NEUROBIOLOGIA.—This new quarterly journal published in Pernambuco gives further indication of the increasing activity in the fields of neurology and psychiatry in all of the South American countries. *Neurobiologia,* which made its appearance in 1938, is the official organ of the Society of Psychiatry, Neurology and Mental Hygiene of North Eastern Brazil. It publishes original contributions with summaries in French or English; also reviews from the literature.

Neurobiologia is edited by Professor Ulysses Pernambucano with an editorial board of 10 representing the various divisions of the field to be covered.

Publication office, Rua do Padre Inglez, 257, Caixa Postal, 651, Recife, Pernambuco, Brazil.

Book Reviews.

GUIDING YOUR LIFE. By *Josephine A. Jackson, M.D.* (New York: D. Appleton-Century Co., 1937.)

This book is intended to be of practical value to the average individual in solving many of the everyday problems of life. Starting out by quoting the passage from Shakespeare about the seven ages of man, the author then proceeds to divide the book into seven parts and discusses the problems of one of these periods of life in each part. The material is presented in a simple and entertaining fashion and should appeal to the group for whom it is intended. Case material is used, with a certain amount of discussion and generalization following in natural fashion. In general the reviewer feels that the conclusions drawn are correct and that persons who are looking for practical advice about everyday problems will benefit by reading the book. It can, therefore, be recommended for reading to patients who wish something that will be helpful. If any criticisms were to be made, it might be said that the book seems a little oversentimental occasionally and that certain physiological explanations of emotions, etc., are stated as unquestioned truths when there is still some uncertainty about the facts in the minds of many physicians.

K. M. B.

PERSONALITY IN FORMATION AND ACTION. By *William Healy, M.D.* (New York: W. W. Norton & Co., Inc., 1938.)

Few persons in the world are comparably equipped to present this theme in the setting of the Salmon Lectures. Anyone of his experience and clinical insights would have much to offer a group of specialists, but seldom will one find added to such an individual (how much of this is a function of A. F. B.?) the present breadth of view and depth of scholarship. The reviewer is less equipped for his task. Engrossed specialism in measurement techniques tempts one to look upon the material on these points, while undoubtedly valid and largely misunderstood, as a relative skimming of the surface. But in the latter third of the volume, and particularly in the final chapter, the outlook is directed with considerable timeliness upon the social implications of the clinical facts the author knows so well. What has gone before has meaning essentially as it enables one to come to grips with such issues. These are the most significant pages of the volume, and whose brevity one most deplores; particularly as they must leave practically out of account the rôle that the variations of personality traits play therein. Here if anywhere is justification for the regret expressed at the cultural lag between knowledge and practise. The general tone however, is optimistic—

as to how much better the world might be. One could again wish that in dealing with this topic the author took a more comparative view—barely touched on in pp. 149-154—there is a little, but so little consideration of how far the difficulties he cites (pp. 194-196) are an essentially cultural product. Neither *Middletown* nor *Coming of Age in Samoa,* nor anything to represent them, appears among the citations. So it comes about that many sound and fundamental conclusions, like that on "informational implementation" wear an intuitional aspect; whereas if the why of these things could have been further pointed out, one would have had better ideas of other directions in which to proceed.

Among the passages specially referable to the reader's attention are those concerned with "circular responses" (pp. 27-30); the slight relation between mental and somatic traits (pp. 30-32); the case presentation of "Orvil," superior adult, regrettably so much confined to the qualitative (pp. 53-69); the commendable substitution of "tension" for the "wish" of psychoanalytic tradition (p. 76); the influence on general reaction tendencies of early family relationships (pp. 86-88); the interest in the study of well adjusted individuals, comparably to those presenting problems (pp. 99-100); the evaluation of techniques for case study (pp. 117-126); special difficulties in personality development met by children of the rich (pp. 145-147); the importance of phantasy life in personality evaluation, including vocational direction (pp. 177-178).

The verbalistic nature of differences between current psychological schools is pertinently criticised, though there is more sympathy than the situation demands, towards the normal illusion that psychological "types" are also species. Well found also are the comments on fixed response questionnaires dealing with personality traits. The remarks on the limitations of "intelligence" as a factor in personality cannot have too wide assimilation among all responsible for social order. Incidentally, the dweller *in partibus infidelium* never had the viewpoint of psychoanalysis more attractively presented.[1]

The outstanding need, if only as controls, for psychogenic studies of normally adjusted individuals is reiterated. The old objection, that only the motive of relief from suffering will impel disclosures of adequate relevance, is rapidly losing weight.

Ordinarily a book containing so much material is slow and difficult reading. This one is very easy reading for its degree of concentration, so easy that the habitually rapid reader can miss a good deal. The professionally interested, at any rate, will do well to reflect more than usual, on implicit meanings while they read. From this standpoint a thorough documentation would also have been very worth while.

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[1] Healy seems to like Jung's dark saying about man in general being "hopelessly unconscious." It recalls the story of a reproach directed during the War at Rennenkampf, the Russian general, that three-quarters of the Russian high command were Germans. Rennenkampf replied the trouble was three-quarters of them were Russians.

Viewed wholly as a literary offering, it is quite the best of the author's that the writer has reviewed, as no doubt it should be. Seldom has so rich casuistic material been embodied with so little marring of continuity. In the past, the reviewer has often carped at Healy's diction and takes the single opportunity noted here. Purist enough for "extravert," he plumps provincially for "instinctual," psychoanalytically conditioned through sexual, and a fair shibboleth for this ideological background.

F. L. WELLS, Ph. D.,
Boston Psychopathic Hospital.

TREATMENT IN PSYCHIATRY. By *Oskar Diethelm, M. D.* (New York: The Macmillan Company, 1936.)

Dr. Diethelm has undertaken a huge task in describing modern treatment in psychiatry but he has accomplished this in an impartial manner and with thoroughness and skill. In the preface of the book he states: "Since the province of psychiatry covers all disorder and malfunctioning of the personality, this book deals not only with the treatment of the major illnesses designated as psychoses and neuroses, but also with the minor personality reactions of everyday life and with reactions to physical illness and handicaps. In the first six chapters the general principles of treatment and various methods are outlined; in the remaining 11 chapters, the treatment of specific reaction patterns, grouped more from a therapeutically practical than a nosologic point of view."

"This presentation of psychiatric treatment is the result of 10 years of association with Dr. Adolf Meyer, the Psychiatrist-in-Chief of the Johns Hopkins Hospital." Diethelm says that while he has been stimulated by his reading and by many contacts with psychiatrists of different training and ideas, "it is nevertheless correct to state that the whole book is based on the teaching and methods of treatment of Doctor Adolf Meyer."

Psychiatry is the treatment of disorders of personality, an analysis of which is given in the first chapter, but the introduction formulates clearly the principle of psychobiological integration upon which the whole work is really based. This introduction and first chapter are of great importance in their basic ideas and in relation to what follows. His outline of systematically studying personality includes discussions of these headings:

1. Intellectual resources. 2. Emotional tendencies and temperament. 3. Volitional and action tendencies, interests and strivings. 4. Standards. 5. Attitude to one's body and to the instinctive desires. 6. Attitude to material needs. 7. Attitude to oneself and ability to deal with oneself. 8. Social needs and adjustment to the group. 9. Assets and handicaps and personality synthesis.

This outline is not rigidly adhered to but is a useful guide. He says: "Any personality analysis will have to be considered from the point of view of the integrated whole," and again: "There are no tests which will offer a thorough understanding of the personality."

Chapter two is entitled "Treatment in General" and it is packed full of sound suggestions not only for psychiatrists but also for general practitioners and nurses. It is an epitome of sound psychiatric practice in individual cases and in hospital routine—what to do and some of the things not to do. "Every physician should be clearly aware of what he is doing for his patient." I have read and re-read the 20 odd pages of this interesting chapter.

Then follow descriptions and evaluations of special methods such as: suggestion and hypnosis, psychoanalytic procedure, various therapeutic procedures, including individual psychology (Adler), analytical psychology (Jung), group analysis (Burrow), psychoanalytic manifestations (Rank and Stekel), persuasion (Dubois), re-education (Kronfeld), indirect methods—association experiments, Rorschach's test. The essential points of each of these methods are clearly brought out as well as their uses and limitations.

"Distributive analysis and synthesis" in the sixth chapter is what Diethelm considers "the most natural approach to the correction of personality difficulties on a psychobiologic basis." As the whole object of psychiatric treatment is constructive, it is first necessary to find the various factors which have caused the patient's reaction and then to try "to achieve a wholesome integration of the total personality as well as of various functions." The patient's complaints are seriously investigated, reduced to their real value—the development of the illness, the life setting, the estimate of the personality—these are learned early by direct approach in ordinary conversation so that the type of reaction can be diagnosed. Various special methods may be valuable in the analysis. The synthesis must above all be practical. Two cases are described in considerable detail.

The last two-thirds of the book deals with treatment of specific types of reactions. In the affective group excitements and depressions are dealt with separately. In the former there is a clear argument for and description of hydrotherapy with much practical detail of its use, while in the latter one finds valuable practical suggestions on sedatives and hypnotics and also other useful treatment methods. Excellent case material is given.

The next six chapters concern treatment of the schizophrenic reactions, paranoid reactions, delusions and toxic reactions, organic psychoses, epilepsy and the part reactions or psychoneuroses. Here again one finds a wealth of material, frequently illustrated by case histories. It is not possible in this brief review to give details of the treatment outlined, but the care and thoroughness of dealing with each type of reaction gives the reader a very complete presentation of what is most desirable.

The treatment of personality difficulties shown by stuttering, occupational neuroses, sexual difficulties, alcoholism and drug addiction is detailed in the final chapters.

A bibliography closes each chapter. The index is ample and the general set-up of the book is excellent.

"Treatment in Psychiatry" is a unique and valuable contribution in this field and I strongly recommend the book to all psychiatrists, whether in private practice or in hospital work.

E. P. Lewis,
Toronto Psychiatric Hospital, Toronto.

CHAGRINS D'AMOUR AND PSYCHOSES. By *Constance Pascal.* (Paris: G. Doin & Co., 1935.)

Dr. Pascal states that the idea that sex expression has a definite bearing on psychoses originated with Hippocrates. The major portion of the book is devoted to a review of Freud's work and the following material represents a summary of Dr. Pascal's concept of psychoanalytic theory and practice. He states that Freud's theory is based on the premise that pleasure is the supreme force of life and the cause of all mental disorders; that after frustration and repression, psychoses are evolved. The work of Freud is a great contribution which is based partly on theory and partly on a vast collection of psychoanalytic observations. According to Pascal, Freudian theory is composed of four fundamental concepts: (1) libido, the instincts, the unconscious; (2) libido, conflicts and repression; (3) libido and its metamorphosis; and (4) the cure of neuroses by psychoanalysis. Dr. Pascal believes Freud has discovered the true value of the sexual etiology of mental and physical disorders. Frustration may be of an exogenous or endogenous nature and the pathogenic emotions which result from frustration are to the psyche what the antigen is to the organism, the symptom complex arising from the unconscious and constituting an emotional antiphylaxis which is incomprehensible to psychiatry. The psychoses resulting from this phenomenon are divided by Freud into three fundamental groups, (1) the actual neuroses which include neurasthenia, the anxiety neurosis and hypochondriasis, (2) the transfer neuroses, which are conversion hysteria, anxiety hysteria and obsessional neurosis, and (3) narcissistic neuroses which correspond to dementia præcox, paraphilia and paranoia. A criminologist added the perversion group and Kretschmer the paranoid states.

This book adds nothing to psychiatric literature and is not recommended.

F. G. E.

MODERN SOCIETY AND MENTAL DISEASE. By *Carney Landis and James D. Page.* (New York: Farrar & Rinehart, Inc., 1938.)

This is a valuable and interesting volume, dealing largely with the statistical side of mental disease from the standpoint of men who have not been trained in psychiatry, but whose association with the field is intimate.

Thus, it appears that mental disease is higher in the old age groups, and in general the incidence is greater among the male than the female population. Furthermore, for the principal mental diseases the average age of onset is quite consistent from one country to another. The actual prevalence of mental disease from one period to another and from one country to another is not known. It is probably true that there is very little racial difference in the incidence of mental disease, and while rates of admission vary greatly in places and groups, these are largely the result of social rather than biological conditions. For example, rural commitment rates are everywhere much lower than urban commitment rates, but the studies establishing this have been done on the actual number of patients in hospitals. When studies

are made as to mental disease in the community, as in the Swedish Census reports, there turns out to be real little difference between rural and urban psychiatric incidence.

A very interesting section deals with the relation of education and economic status to the type of mental disease, and a conclusion is reached which may or may not be substantiated. The sliding scale of aristocracy, so to speak, of the mental diseases starts at its lowest level with the senile dementias, cerebral arteriosclerosis, general paresis, and then ascends through alcoholic insanity, dementia præcox, manic-depressive insanity, involutional melancholia, psychopathic personality and paranoia, and winds up as the peak of the scale is reached with the neuroses.

The chapter on marriage and eugenics brings out what has been quite well known for a long time, that in dementia præcox there is a very low marriage rate; that in the senile psychoses the marriage rate is about that of the general population, and that consequently marriage acts as a eugenic barrier, shutting off those who lack attractiveness and drive, which is notably the case in dementia præcox as in other diseases. There is a relative excess of widowed, single and divorced patients.

One defect of this book appears quite conspicuously at this point. The references have been very poorly collected and too great a partiality shown for New York work even where prior work has established the point that is made. A great deal of fundamental work is entirely neglected, and while one cannot ask for a complete bibliography, priority and the official status of research ought to count (for example, the work of Dayton, the annual reports of Massachusetts, the Report of the British Royal Commission and the Report of the American Neurological Association Committee for the Investigation of Sterilization).

A very interesting section deals with mental disease in American population groups, in which it is shown once and for all that the bugaboo that the foreigner has a greater amount of mental disease than the native is based on poor statistics. When correction is made for age, for urban and rural dwelling, and for other easily selected factors, the difference between the two groups disappears. There is probably no fundamental racial psychopathology in the sense that races differ markedly in respect to mental disease. Whatever differences exist are largely statistical error or depend upon special cultural situations.

The section on whether mental disease is on the increase does not differ fundamentally from the conclusions drawn by Committee of the American Neurological Association for the Investigation of Sterilization, which was based on work done by Elkind and Taylor. Elkind especially deserves great credit for pointing out that whatever increase is present is not due to biological situations but is largely social. The reviewer also stresses the fact that any statistical study of mental disease should take into account the uncertainty of diagnosis at the present time, should not attempt to differentiate between cerebral arteriosclerosis and senile dementia, since this is not on the whole done successfully during life, might profitably lump together manic-depressive psychosis and dementia præcox on the basis that the differ-

ential diagnosis, although clear-cut in the typical case, is certainly not clear-cut in many cases, since hospitals in the same vicinity differ markedly in their ratios of commitment of these two diseases.

If a crude division of the mental diseases is made, it will be found that, first, there is no increase in commitment rate in any well stabilized society where hospital facilities are adequate; and, secondly, that the diseases on the increase are the senile diseases, and this is due largely to the advancing age of the population plus the greater friendliness of the community toward the hospital, plus as a final factor, the increasing difficulty of taking care of senile individuals in cities and urbanized rural communities. Dementia præcox and manic-depressive psychoses are not increasing and are remaining about level. The alcoholic psychoses were decreasing before prohibition and have remained about on a level after the first year or two following prohibition. The syphilitic psychoses are diminishing. By breaking up the diseases into these groups a very interesting picture of the epidemiological relationships of mental disease is presented.

On the whole, this book is an excellent one and very well worth studying.

A. Myerson,
Boston State Hospital, Boston.

Malnutrition—The Medical Octopus. By *John Preston Sutherland, M. D.* (Boston: Meador Press, 1937.)

After reading this exposition of the author's unusual dietetic views one wonders how it happens that so many people are alive! Meat and milk are apparently so much poison; we should confine ourselves to ripe fruits, vegetables and grains in their native state. If we are to adopt the author's preachments and become strict vegetarians, man will cease to be the "sickliest of all created things," we are told. Perhaps the age distribution of the population is becoming skewed enough already, without further magic prescriptions for the attainment of longevity!

Mildred E. Parker,
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A Mind Restored: The Story of Jim Curran. By *Elsa Krauch.* (New York: G. P. Putnam's Sons, 1937.)

The hero of this book, a business man who spent a considerable period in a private and then a state hospital for mental diseases, tells his experiences in narrative form. It is not made clear how the female author came by this story, whether it was told to her, whether she rewrote it for the hero, or whether she helped him to express himself. William Seabrook, the author of a much-read book about his alcoholic cure in a private sanitarium, has written an introduction.

This type of book has often been written. The present volume does not belong to the better kind of this variety of literature. The blurb describes it as "a descent into the twilight land of insanity and an ultimate return to

100 per cent mental health." Though written in a fluid style the book is on the whole rather dull. It is evidently well-meaning and sincere, but it does not show the kind of insight that would make it very enlightening to either the general reader or the psychiatrist.

Although the general setting of the book is accurate, such statements as, "Still the idea persists, everywhere, that all mental disturbance inevitably includes this (homicidal) trait," are misleading rather than helpful. It would be an interesting task for a psychiatrist sometime to collect the stories written by patients about themselves and to distill their most helpful features.

FREDERIC WERTHAM, M. D.,
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PLAY AND MENTAL HEALTH. PRINCIPLES AND PRACTICE FOR TEACHERS. By *John Eisele Davis, M. A.* (New York: A. S. Barnes and Company, 1938.)

The writer of this book is well known for his activities in correlating physical activities with mental hygiene, and in this book he has extended his observations to indicate the importance of so controlling the play activities of children that they may become factors in developing mental health and conduct adjustment.

In his first chapter, "Play and Psychic Adjustment," he stresses the value that play may have in promoting the social consciousness of the child and in training him in cooperative effort. It is emphasized that play is laughter and fun and the author deplores the foolish emphasis on winning which tends to make the timid child more prone to isolation and those more aggressive to seek alibis for bad plays in criticisms of grounds or equipment. The teacher or physical director must know the personality of the child and select the play activities which in the timid child will best promote social aggressiveness, self-confidence and a cooperative spirit, and which will aid the domineering type to subordinate his personal aggressiveness to cooperation with his mates and make him group conscious. The quiet child is too often ignored and his tendency to day dreaming and fantasy is allowed to go unchecked because of his apparent cooperation. It is necessary for the teacher to know the child's home life and influences as well as his conduct on the playground if proper play adjustment is to be made, which also implies a sound mental adjustment to adult life. Tendencies to introversion must be overcome. Play may be guided by either equality or dominance, therefore it is wise to group children with nearly equal capabilities in order that a feeling of inferiority in an individual may not be increased.

In his chapter on "Play and Adjustment to the Outside World," Mr. Davis begins by stressing the importance of the nursery teacher using the toys given a young child in the proper and constructive way and at the same time giving expression to the pleasurable emotional response which such a situation should provoke. She should also be careful to use the proper words describing the play equipment and the states produced, so as to form wholesome as-

sociations and add to the child's early knowledge of language and symbols. He then gives an admirable summation of the characteristics of various ages and warns the teacher against projecting a more adult influence in her contacts, of setting up adult standards for the child to meet rather than having him "compete against his own capacity as the standard." She should "grow up" with the child. Chores may be used to inculcate a sense of responsibility and of cooperation, and teach the child to grow into reality.

In the third chapter, "Play and Behavior," it is stated that "mere physical strength and physical health, while most desirable conditions, cannot supplant the education of the emotions," thus agreeing with the views of psychiatrists. "Mere bodily vigor does not represent the aim of the modern educator but organic health, laying the foundation for the most effective development of emotional and volitional organization, is the objective." This expresses the objectives of mental hygiene. "Play projected with such an aim in mind, with due cognizance of its many weaknesses as well as strong points may be of distinct value in such a hygienic relationship." Such a statement indicates the keynote of the book. Woven in with the discussions on the psychology of play are many practical suggestions.

"Happy Socialization" is the title of the concluding chapter. "The suppression of natural play expression undoubtedly results in much harm to a balanced personality." The child should not be thwarted by too many restrictions, too many "keep off the grass" signs, but should be allowed considerable freedom, both of action and vocal expression. As a rule, the teacher is concerned with the pupil's acquisition of knowledge and his promotion to higher grades and subjects, yet the development of personality should be the chief aim. Education should be a subtle experience and the child should be permitted to learn before we attempt to teach him. Play permits the development of many emotional experiences. Cooperative play teaches socialization and the ability to cope with life situations. It also develops individuality and spontaneity. This chapter concludes with a number of "hygienic considerations" for the guidance of the teacher in carrying out a program of physical education for the child.

It is believed that this book will be most helpful to all those who are interested in the education of children or training the maladjusted to more normal living. Fairly frequently the author illustrates a point by describing an experience with one of the psychotic cases with which he is chiefly occupied, but the psychiatrist can easily apply the principles enunciated or the child illustrations to his own patients. Psychiatrists will also find much of interest in the book and will appreciate the summation of much knowledge which may have come to them in fragmentary form.

The book should be of great value to teachers for whom it was written, but it should also serve as a guide and inspiration to young parents who may learn much of child guidance from it.

W. R. D.

CHILD GUIDANCE PROCEDURES. By *Paul L. Schroeder, M.D.* (London: D. Appleton-Century Company, 1937.)

This book is a clear presentation of the work of a good child guidance clinic. It comes from the Institute for Juvenile Research in Chicago.

Part I discusses the variety of problems for which children are referred to child guidance clinics, and the general nature of childhood needs for comfortable adaptation.

Part II presents the ingredients of "The Diagnostic Study" which each child is given. It comprises "The Social History, The Medical Study, The Psychological Examination, The Recreation Study, The Psychiatric Interview and Synthesis and Program of Therapy." The diagnostic study is made by five different specialists whose province of investigation seems strictly limited to their own specializations. The history of the child is taken by a social worker. The body of the child is examined by a pediatrician. The recreational interests are investigated by a recreational specialist. The psychiatrist's province is limited to an investigation of the child's emotions. This is the characteristic pattern of child guidance clinic procedures, and as such is of course in opposition to those who hold that the first contact with a child problem should be made by the psychiatrist in taking a history from parents in conjunction with a review and digestion of data coming from social agencies and schools. In this particular book the scope of each specialist is well covered in the respective outlines. In the chapter on "Medical Study" one misses however, reference to the biological set-up and habitus of the neuropathic constitution, for example, with its traits of undernutrition, tics, nervous instabilities, etc. The chapter on "Psychological Examination" carefully reviews many different tests of intelligence and vocational skills. It does not touch upon the significance of such important points as scattering in the intelligence tests, the common and frequent relationship of declining I. Q.'s to the maladjustments of childhood especially in the adolescent period, and it does not urge repeated intelligence testing from year to year in the following of any given problem child.

Part III is devoted to "Therapy: Illustrative Cases." These cases are grouped into (a) Problems arising from interference with the child's opportunity to grow; (b) Problems arising from failure to support the child's dependency; (c) Problems arising from failure of proper direction, training or control; (d) Problems arising from the constitutional inadequacy. Each group comprises four case histories. The case histories illustrating material in (a), (b), (c) are with one exception the stories of children with superior or above average intelligence. The facts presented are forceful and instructive. The case histories illustrating material in group (d) are stories of feebleminded children. They also are excellent and to the point. The clinical worker in child behavior, however, finds himself wondering what treatment is recommended for the great mass of children between the precocious and feebleminded, who water-log late elementary school and junior high school classes, and getting beyond their intellectual depth drift gradually into truancy and delinquencies. No mention is made of the psychopathic child who is so unresponsive to training as a young child, becomes more aggressive

and difficult with advancing years, and finally in his teens is shunted about among juvenile court, industrial schools and psychopathic wards. The lay reader of these illustrative cases is very apt to get the impression that if he only could dig deeply enough and had the right techniques he could adjust every child behavior problem satisfactorily.

Part IV, dealing with "The Relationship between the clinic and the community," is excellent.

ESTHER L. RICHARDS, M. D.,
The Johns Hopkins Hospital, Baltimore.

FINDING YOURSELF IN YOUR WORK. By *Henry Walker Hepner.* (New York: D. Appleton-Century Co., 1937.)

The author of this book is at the vocational psychometric laboratory, Department of Psychology, Syracuse University, and has had practical experience in charge of personnel research for a number of large corporations. The book starts with a foreword to counselors, which would make it appear that the book was intended for the use of counselors. While it is undoubtedly an excellent book for counselors, it is also one which the individual of average intelligence can read with profit. The material is presented in extremely simple fashion, illustrative diagrams are used which reinforce and clarify the material in the text, and charts and diagrams further supplement all this. The book starts out by discussing the more basic qualities of the personality and how they may be modified, and then goes on to more specific details about the actual securing of positions and the planning of a career. In addition, various tests which will aid in determining the career for which one is fitted are given, including such things as abstract intelligence test, personality maturity test, social knowledge test, and vocational interest test. Methods for scoring these and utilizing the knowledge from such scores are also given.

The whole book is written at an extremely practical level and the explanations, as given by the author, seem in general to fit in with the accepted teachings of psychiatry. The whole attitude of the book is one of encouragement and helpfulness so that its effect on most readers will be to encourage them to persevere in their efforts to attain a suitable career. The reviewer, therefore, would recommend this book for general reading. Not only will it be helpful to those who are still undecided about a career, but the practical advice on how to utilize one's time, how to make the most out of one's capacities, and the healthy tone of the book make it suitable for general reading.

K. M. B.

SHORT-WAVE DIATHERMY. By *Tibor de Cholnoky, M. D.* (New York: Columbia University Press; London: Oxford University Press, 1937.)

Dr. Cholnoky has written this 310 page book in which he outlines the physical basis and clinical application of this type of therapy. The contents of the book are as follows:

Contents: Part I—Introduction: Historical Outline of Short-Wave Diathermy. Part II—The Physical Aspects of Short-Wave Diathermy.

Part III—Experimentation with Short-Wave Diathermy: 1. Experiments on Bacteria and other Organisms; 2. Experimentation on Animals; 3. Wave Lengths. Part IV—The Technic of Short-Wave Diathermy: 1. Short Waves and Other Treatments; 2. General and Mechanical Principles in Short-Wave Technic. Part V—The Clinical Applications of Short-Wave Diathermy: 1. Infectious, Allergic and Metabolic Diseases; 2. Diseases of the Respiratory Tract; 3. Diseases of the Gastro-Intestinal Tract; 4. Diseases of the Genito-Urinary Tract; 5. Diseases of the Circulatory System and the Lymph Glands; 6. Diseases of the Locomotor System; 7. Diseases of the Nervous System; 8. Miscellaneous Conditions; 9. Malignant Diseases. Part VI—Conclusion. Bibliography. Abbreviations. Index.

The author's experience has been principally in Europe and the book is written almost entirely from the standpoint of the work that has been done in this field abroad. Since, according to several authorities, short-wave diathermy procedures are more advanced on the Continent this is a time-worthy contribution. The reviewer obtained the opinion of certain authorities in this field who stated that the book was technically sound and one which could be accepted as a standard treatise on this subject.

A bibliography of 37 pages is included in the book.

EDWIN E. MCNIEL, M. D.,
Payne Whitney Psychiatric Clinic, New York City.

ALLGEMEINE SINNESPHYSIOLOGIE. By *Yrjö Renqvist—Reenpää.* (Wien: Verlag von Julius Springer, 1936.)

In the preface to this book the author, who is professor of physiology in the University of Helsinki, states that so far as he knows no work on the physiology of the senses has appeared in print since 1923 when V. Kries' *Allgemeine Sinnesphysiologie* was published. He believes that there is an urgent need for such a book now.

In order to conform to modern tendencies he employs the term "psychophysics" to designate the scientific experimental investigation of the physiology of the senses.

His aim was to determine the various contents of the action spheres of each one of the special senses. Early in his experiments he discovered that most of the special senses consist of several modality spheres, and that each sphere has different contents. He tried by careful elimination to exclude all contents but one in each sphere. The one remaining content in each sphere, that which defied further analysis, he called the basic, monotonous, or unidimensional factor or element of a multi-dimensional configuration content. Thus, the visual modality sphere, for example, would be found to contain various contents for color, various contents for visual intensity, various contents for configurational vision, etc. He also found that some of the senses cannot be so analyzed, and some senses cannot even be separated into two distinct and separate units, as would be indicated by the definite terms by which each is commonly designated.

All this work was carried on under rigidly controlled conditions in the author's laboratory, chiefly for the purpose of determining scientifically the bases for the human formation of perception, primary concepts, representational concepts or abstract symbolisms, etc. With the help of 15 graphs and a considerable number of mathematical formulæ the author seems to prove the validity of his plea, namely, that the exact scientific experimental study of the physiology of the senses deserves a high place in the sciences, which are interested in the study of human behavior.

MATTHIAS MARQUARDT, M. D.,
Augusta, Me.

EMOTIONS AND BODILY CHANGES. By *H. Flanders Dunbar, M.D., Med. Sc.D., Ph.D.* Second Edition. (New York: Columbia University Press, 1938.)

The first edition of this work, published in 1935, was reviewed in the November 1936 issue of the JOURNAL. It contained a survey of the literature on psychosomatic relationships from 1910 to 1933, undertaken with the support of the Josiah Macy, Jr., Foundation.

In the present edition a new introduction has been provided to cover developments in this field since 1933. The bibliography has also been extended to include somewhat more than 100 of the more significant contributions to the literature during the past five years.

With regard to the term "psychosomatic" which seems to be as good as any to express the totality of the mind-body relationship and interaction, but which might be open to criticism because of the dichotomy it suggests, the author appropriately observes: "When medicine has apprehended the psychosomatic problem and assimilated it, the adjective will be obsolete: all medicine will be psychosomatic."

This book has established itself as an authoritative work of reference and orientation in a new field of modern medicine, the findings of which are recognized as of the first importance, and which may be destined to make the medicine of the future more truly an art as well as more completely scientific.

C. B. F.

In Memoriam.

J. ALLEN JACKSON, M. D.

1884-1938.

Dr. J. Allen Jackson, superintendent of the Danville (Pennsylvania) State Hospital for Mental Diseases since 1920, died of leukemia on December 1, 1938, at the Jefferson Hospital, Philadelphia, after a long illness. He was 54 years of age.

Born in Upatoi, Georgia, he graduated in 1906 from the Jefferson Medical College. Following internship in the Philadelphia General Hospital he served from 1908 to 1910 as pathologist at the Central Indiana Hospital for the Insane. From 1910 to 1920, he was in charge of the mental department of the Philadelphia General Hospital. During this period he participated in the organization and direction of the newly constructed Philadelphia Hospital for Mental Diseases at Byberry, the institution recently taken over by the Commonwealth and now known as the Philadelphia State Hospital.

Through his leadership, the Danville State Hospital reached the front rank, not only as a mental hospital but also as a centre for community activities. Dr. Jackson was an active member of the Pennsylvania State Medical Society being the chairman of the mental hygiene committee. He was an associate editor of the Pennsylvania Medical Journal, a member of the Editorial Board of The Modern Hospital, and editor of the Mental Health Bulletin, the latter being printed at the Danville State Hospital.

He had served as secretary of the Philadelphia Psychiatric Society, president of the Association of Trustees and Superintendents of the State and Incorporated Hospitals for Mental Diseases and Defects of Pennsylvania, and president of the Pennsylvania Hospital Association. As a fellow of the American Psychiatric Association, he served as a councillor, member of the Executive Committee, and the Board of Examiners, and was a member of the American Board of Psychiatry and Neurology, being nominated

to the latter from the Section on Nervous and Mental Diseases of the American Medical Association. He belonged to many medical societies and served as an adviser on numerous boards and commissions.

In 1929, he received an honorary degree of Doctor of Science from Bucknell University. He was a member of the Presbyterian Church, and a 33° Mason.

A congenial friend, an eloquent writer and speaker, an able physician and hospital administrator, a frequently consulted authority in the field of psychiatry, it was a privilege to have Dr. Jackson as a colleague. He will be greatly missed.

Surviving him are his wife, Hazel Craig Jackson, and a daughter Hazel Miriam Jackson.

W. C. Sandy.